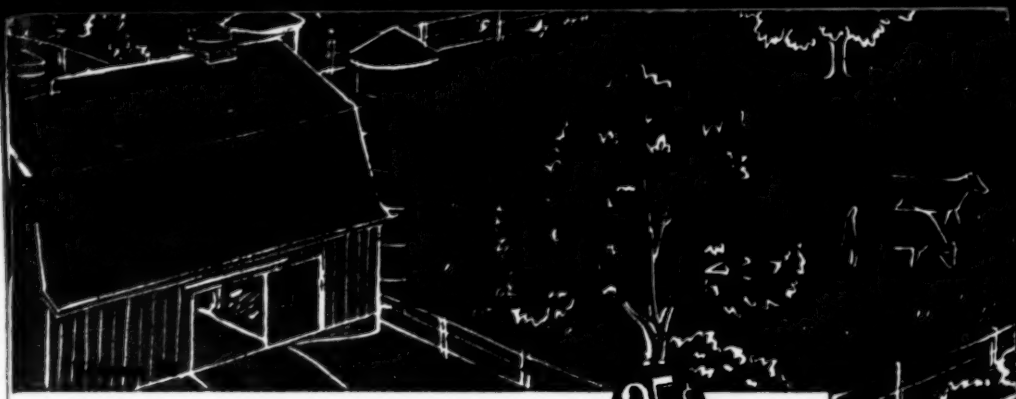

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THE FARMER'S DIGEST

FORT ATKINSON WIS

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The Farmer's Digest

Volume 20 October 1956 Number 4

What About Propane Tractors?

These Canadian farmers believe that L.P.G. models give them more power for less money . . .

Condensed from The Country Guide

C. V. Faulknor

FACED with a declining income, the farmer is taking a long look at anything which shows promise of reducing production costs. In Alberta and Saskatchewan, Canada, there has been renewed interest in propane-fuelled farm machinery, principally tractors.

Although propane, or liquid petroleum gas (L.P.G.) models have been carried by most dealers since 1950, sales have never been very heavy. The chief reasons for this have been the special storage equipment needed for the fuel, plus the fuel cost and availability. But these three factors have now changed so that the situation can be re-examined. Owners of L.P.G. tractors queried are well satisfied with their machines—several, in fact, are ordering additional propane models this year.

Liquid petroleum gas, or propane, is a by-product of the oil industry, where production is heaviest in the summer months. For every ten gallons of gasoline made, two gallons of propane are produced. A slight change in the process could double the propane fraction, if a large summer market could be found for the gas so that great quantities wouldn't have to be stored.

At present, the gas is chiefly used for cooking and heating, with the heaviest drain on supplies in the winter months, when production is lowest. Even under these conditions, however, we were unable to find anyone with

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a gas contract who had suffered because of a lack of supply. As an Alberta government fuel official said: "With new wells coming in all the time, and the oil industry growing by leaps and bounds, it's hard to imagine any shortage in future propane supplies."

One of the main objections heard against propane-fuelled tractors is that expensive storage tanks are needed to maintain a supply of fuel on the farm. At least one major fuel supplier now offers a tank-lease arrangement for Alberta farmers that puts a 1,000-gallon tank on the farm for 99 years, the firm to keep the equipment painted and in good repair during this period, as well as providing a guarantee against leakage loss. Under this agreement, tank rental for the full period is $485, payable over four years, interest-free, with a 20 per cent discount for cash. In Saskatchewan, the same type of deal is available, but the rental charge is somewhat less.

Fuel storage costs are not confined to propane-powered machines. Large farm operations using gasoline or diesel models generally require storage tanks and pumps, and smaller farms have a certain amount of capital tied up in fuel drums. On the other hand, most farmers with L.P.G. tractors also use propane for heating and cooking, so that storage equipment costs should not be charged solely against tractor operation.

What about fuel cost? Depending on the locality, this ranges from 13 to 18 cents a gallon, or about six to seven cents below the price of farm-delivered gasoline, and two to three cents per gallon cheaper than diesel oil. Most experts agree that at this level propane fuel becomes an economical proposition.

The 1954 propane bill of Adialard Corbiell, near Cluny, Alberta, was $652.44. This covers operation of a 42 h.p. (drawbar rating) L.P.G. tractor for 1,000 hours, plus one year's fuel for a propane cooking range, fireplace, furnace, hot water tank, and chicken brooder. Adialard's 1955 fuel bill increased to $707.88 when he added a propane-fuelled, self-propelled combine to his farm equipment. Incidentally, although results of Nebraska machinery tests indicate that propane tractors in this h.p. range generally burn about 3.6 gallons of fuel an hour, as compared with 2.0 to 3.0 gallons for a similar gasoline model, Corbiell says he's been getting by on 1.7 to 2.0 gallons an hour, which is far below the average. Experiments at the University of Alberta in 1951 showed L.P.G. tractors as using one-tenth more fuel per hour than gasoline mod-

els, but developing from 1.5 to 2.0 more horsepower per gallon.

D. C. Eddy, Froude, Sask., also claims 2.0 gallons an hour on a factory-made propane model, and Doug Ray of Carievale, Sask., rates his 39 h.p. factory

Changes in American eating habits are requiring a shift to increased production of vegetables as well as livestock. If present trends continue, U. S. farmers will need to produce 43 per cent more vegetables in 1975 than now. Similar increases are expected in fruit consumption.

machine as being as economical as a diesel, and more economical than a gasoline model. Tom Grandy of Oxbow, Sask., who has both a converted, and a factory-made propane tractor, finds that even the converted machine gives more power than when it ran on gasoline, However, most authorities agree that not all tractors lend themselves to conversion, and that more power and efficiency is obtained from a machine especially designed to burn propane.

A large tractor repair depot in Regina reports a 50 per cent reduction in servicing on propane models, because of the dry burning qualities of this fuel. Burning either gasoline or diesel oil leaves gritty carbon deposits in the combustion chamber, which increases cylinder and piston wear. These fuels also form various sulphur compounds that dilute lubricating oil. On the other hand, when propane is used as a motor fuel it is completely burned in combustion, so that L.P.G. engines generally need a valve job only every three or four years, instead of once a year.

C. Rochenbach of Wrentham, Alberta, with a 55 h.p. L.P.G. machine in use 500 hours a year, changes oil at the start of each season, and his oil filter only once during the season. His oil stays clear all the time. This has been the experience of several other operators contacted, al-

"Ideals are like the stars—we never reach them, but like mariners on the sea, we chart our course by them."
—Carl Schurz

though tractor dealers don't recommend that their machines be run too long without an oil change. They estimate that a gasoline tractor uses a quart of lube oil a day, and a propane model about one pint a day. Over the years, savings on repair costs and lube oil purchases would amount to quite a sum.

When asked about cold weather starting, most operators agreed that L.P.G. tractors don't start

easily when temperatures are low, and that a block heater is necessary, unless the machine is kept in a heated shed. However, dealers claim that a properly adjusted propane tractor starts just as easily as any other model; and point out that block heaters should be standard equipment for all types of machines used in severe weather.

Another objection often voiced against propane tractors is that refuelling requires special pumps and hoses to withstand the high pressure involved. Actually, no refuelling pumps are needed at all, because the fuel is under constant pressure in the storage tank, and will flow to another container, either as gas or liquid, as soon as the pressure is relieved.

What does all this add up to in dollars and cents? Under present conditions, the annual fuel cost for a propane tractor would appear to be less than that of a similar gasoline machine, and about equal to that of a diesel model. By developing more horsepower per gallon, the machine should also do more work. In both repairs and lubricating oil saved, the L.P.G. tractor should represent a real saving, amounting to at least 50 per cent of the average costs incurred by other models. On the other hand, the purchase price of a propane machine would be about $250 more than that of a gasoline model, and some $400 less than that of a diesel tractor of comparable size.

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACTS OF CONGRESS OF AUG. 24, 1912, AND MARCH 3, 1933, AND JULY 2, 1946, of the Farmer's Digest, published 10 issues a year at Fort Atkinson, Wis., for October 1, 1956.

State of Wisconsin
County of Jefferson
SS

Before me, a Notary Public in and for the State and County aforesaid, personally appeared Hugh Highsmith, who being duly sworn according to law, deposes and says that he is the publisher of the Farmer's Digest and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, and July 2, 1946, embodied in section 537, Postal Laws and Regulations, to wit:

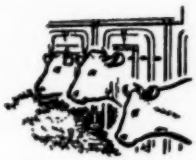
1. That the names and addresses of the publisher and digest editor are: Publisher, Hugh Highsmith, Fort Atkinson, Wis.; editor, L. Bush-Brown, Ambler, Pa.

2. That the sole owner is Hugh Highsmith, Fort Atkinson, Wis.

3. That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages or other securities are: none. Signed, Hugh Highsmith, Publisher.

Sheldon Vance, Notary Public. (My commission expires September 15, 1957.)
Sworn to and subscribed before me this 27th day of September, 1956. (Seal).

Facts, Figures on Bulk Milk Tanks



Bulk handling of milk is bringing big changes. There are many advantages and some disadvantages . . .

Condensed from University Farm News

THE familiar 10-gallon milk can may soon be as out-of-date as the work horse. Bulk milk handling is slowly bringing the change.

The system has some important advantages for farmers, milk plants and milk haulers. But there'll be some disadvantages, too, say specialists at the University of Minnesota.

On the advantage side, farmers who start bulk milk handling can look forward to lower hauling costs. Milk can be picked up every other day instead of daily. The milk will also stay at higher quality, thanks to the quick-cooling features of most modern bulk tanks.

Getting rid of the cans will save that expense, either for the farmer or the plant, and it will also mean no more lifting.

High initial cost for the bulk tank and the equipment that goes with it is the big drawback for most farmers. Depending on their size, tanks vary in cost from $1,500 to $3,000, and cleaned-in-place pipelines for carrying the milk directly from the stall or milking parlor to the tank can add even more to the cost.

It often takes a complete remodeling job in the milk house to put in a bulk handling system. Bulk tanks usually require more electricity than the farmer used before, because the milk is cooled to a lower temperature. And bulk tanks need to be washed and sanitized by the farmer, meaning a little more chore time.

Milk plants get better quality milk and usually have lower refrigeration costs when they start bulk handling. That's because the milk is cooler when it comes in. It also means that can intake and washing facilities aren't needed if the plant makes a complete conversion to bulk operation.

Every-other-day milk handling makes handling and bookkeeping easier for the plant, and milk procurement costs are lower when the plants get all their milk from farm bulk tanks. And bulk handling means avoiding the milk loss

that comes from milk "sticking" to cans.

Converting to bulk hauling has some disadvantages for the plant, too. Alterations are often costly and the plants often have to buy the tanks used by the haulers, regardless of who owns the trucks.

"The plain truth is that Americans, as a people, have never learned to love the land and to regard it as an enduring resource. They have seen it only as a field for exploitation and a source of immediate financial return."

—Dr. Hugh H. Bennett

And it's necessary to put in washing facilities for tank trucks. Truckers must be trained to weigh and sample milk.

Truckers have much less hard work to do with bulk handling—no cans to lift. In some cases there's a chance for more earnings per hour for haulers if they pick up more volume at each stop. Of course, the hauler will have a greater investment if he owns his own tank.

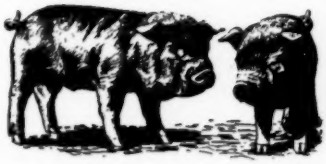
The economists say that savings from receiving milk in bulk instead of cans are greater for small plants than for larger ones. Plants that handle a daily volume of about 40,000 pounds of milk could save 22 cents per hundred, compared to handling milk in cans. But for a plant handling 75,000 pounds the saving is only 11 cents per hundred and only 7 cents for plants doing a 160,000 pound-per-day business. That's because handling costs per hundred with cans get smaller as volume gets larger, but bulk handling costs per hundred are the same regardless of the volume handled.

Farm Equipment Costs Money

"Equipment for a farm job takes twice as much investment as for a factory job." This statement, taken from a study by the Council for Technological Advancement, emphasizes the high cost of becoming a farmer under today's conditions. The average American worker uses $12,500 worth of equipment for his job, reports the study.

The investment of a farmer in land, buildings, livestock, tractor, and other equipment represents a sizeable figure. With all this money tied up, the farm must produce a sizeable income through the sale of products to pay interest on the investment and provide a living wage for the farm operator. Modern farming is a business that needs sales to provide income. The small subsistence farm is falling by the wayside in rapid progress that is being made on farms throughout the country. *West Virginia University*

Better Hog Production



An interesting approach to the development of the meat-type hog . .

Condensed from
The Nation's Agriculture

Gordon McCleary

WE'RE producing too much lard. Everyone agrees to this — producer, packer and housewife. Excess fat on our recent hog crop probably caused much of the price break. At any rate, hogmen must couple unfavorable market prices with overweight, and overfat, hogs.

Where do we seek improvement in the swine industry? Many producers are looking in the same direction farmers looked for improvement in corn . . . a route which included hybrid breeding.

Better hog producers in the midwest have put renewed emphasis on a production program aimed at larger litters, faster gains, meat type animals, multiple farrowings, marketing at desirable weights, disease control and proper selection of gilts.

Certain of these involve management, of course. But some center directly on breeding. From a combination of the two have come rather spectacular results.

For a starter, look at the record of Cornie Boersma, of Inwood, Iowa. He sent to market, in 1955, an average of 10.7 pigs per litter. That amounts to 3.7 more pigs per sow than the state average. He marketed his hogs at an average weight of 213 pounds, in 182 days, getting an average daily gain of 1.17 pounds.

This level of hog production is no accident. Boersma is a top man in his business. And if anyone makes money on hogs, Boersma will. If others make average profits, he'll do even better. More important: What Boersma is doing, you can do.

Probably you are already following most of his management practices. You likely buy a boar that will provide hybrid vigor in your herd. Estimates have been made that from 94-96 per cent of all market hogs have some cross-or-inbreeding.

Probably you follow a health program, use farrowing stalls, select your litters carefully. But for maximum results, you should follow a complete production

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program. Skipping just one point won't merely lower your chances for success fractionally. It can practically cancel out the benefits of several other points. Let's list the points:

1. Larger litters to market
2. Faster gains
3. Meat-type hogs
4. Marketing at weights the market demands
5. Multiple farrowing
6. Freedom from disease, parasites
7. Proper selection of gilts
8. Feed conversion.

Let's mention a few of these points, then look at some breeding work being done in Iowa that has put real meaning into the 8-point program.

First, selection of gilts. Choose them from sows that produced good litters, earmark them at birth. This lets you sort out gilts with both good looks and good background.

Next, disease control. Many farmers in concentrated hog areas vaccinate against hog cholera. Some protect against erysipelas, worms, mange, infectious enteritis. Do you? And do you clean up properly in farrowing pens? Guard against new disease being brought to your farm?

Fast gains make you money. With good feed conversion, they help you offset the down markets. Less feed per pound of pork means lower costs. Get a pig to market at 5½ months, on 600-700 pounds of feed . . . and you're scoring well on two other points.

The term "meat type" is used widely. It's hailed as the cure-all for the farmer, the answer to packers' prayers, the perfect meat for the housewife. There's some truth in all these claims. We started losing our market for lard in the 1920's. By 1940, it had pretty well disappeared. The consumer wants more lean cuts than she is getting, even if she must pay a little more.

There are several good ways to achieve failure, but never taking a chance is the most successful.

But there are economics involved here, too. Packers are accused of "wanting what's in short supply" at any given time. The top price goes to what there's the least of—an old supply and demand axiom. Right now, the meat hog is in demand, because there are relatively few of them. Is it stretching a point too far to raise a question as to what might happen in the market if we produced all meat-type hogs? Can we overcompensate for the current shortage?

To be safe, perhaps we should gear the hog business to producing what the market wants. The ideal hog would be one

which would go as "meat type" when lean meat is in demand—and which could be fed economically to 260 pounds if demand calls for heavier hogs. This kind of animal would give the producer two "outs" in his struggle for top market.

Because a large part of the 8-point program — larger litters, faster gains, meat type, feed conversion — depends on breeding, one Iowa concern has turned its efforts to supplying farmers with improved breeding.

As V. B. Hamilton puts it, "Only half of the genes come from the sow. No matter how good a job of gilt selection you do, you still must count on the boar for half of the results."

Hamilton and his associates, with this in mind, sought to improve the male side of the hog picture through hybridization.

They set out to develop a hog with characteristics to fit a market-producer's needs. They took the best of the several breeds, "played the field" to select the specific characteristics wanted.

Hybridization in hogs has been done, and successfully, by several Midwestern land-grant colleges, and by the USDA.

How well is hog hybridization working?

Results are excellent. One breeding stock farm's reports show farmers using their hybrid boars sent an average of 8.77 hogs to market per litter. The present state average in Iowa is approximately 7 hogs per litter.

On a grade and yield basis, hybrid-sired pigs make an impressive record. One group of 38, sold to Rath by Harold Lageschulte of Janesville, yielded 74.26 —5.08 per cent higher than the average yield that week. On top of this, the producer had bigger litters, faster gains, more economical feed conversion.

A study of America's food purchases discloses that the largest single item in the food bill is beef. The average person last year ate 81 pounds of beef and it is forecast that the amount will be upped a pound this year. The average annual consumption has been slightly over 60 pounds per person during the past half century.

Evidence is piling up that the eight-point program works best with best possible breeding.

It seems completely logical that breeding for the specific characteristics we want, plus top management, can supply the packer and the housewife with what they want . . . and at the same time provide a pattern by which the hog producer can fare the best. This is a pattern hog men seek.

Chemicals Can Cut Feed Costs

Purdue research shows that feed costs were cut 26% with a female hormone and an antibiotic fed in combination . .

Condensed from The Shorthorn World

PURDUE University animal nutrition specialists reported at a recent Purdue Cattle Feeders Day that feed costs were cut 26 per cent when a female hormone and an antibiotic were fed in combination to fattening steers.

Another interesting conclusion revealed that implantation of stilbestrol under the hide of steers is an economical and efficient method of administration.

In addition, there were reports of interest to cattlemen on the self-feeding of ground ear corn, results of different levels of aureomycin in a fattening ration, value of high moisture corn, and pasture for growing and fattening cattle.

W. M. Beeson, head of the animal nutrition work at Purdue, summarized the research work on the effect of feeding a female hormone and an antibiotic alone and in combination. He said that when 12 milligrams of the hormone hexestrol and 100 milligrams of the antibiotic aureomycin were fed daily to each steer in combination, growth rate increased 37 per cent and feed efficiency improved 26 per cent over that of steers fed a basic ration. The steers gained 2.79 pounds per day during the 103 day experiment as compared to 2.03 pounds per day for cattle fed neither a hormone nor an antibiotic.

Beeson disclosed that the feeding of 12 milligrams of hexestrol per animal daily to two-year old steers in drylot resulted in a 24 per cent increase in growth rate. The feeding of 100 milligrams of aureomycin resulted in a 10 per cent increase rate.

Feed cost per 100 pounds of gain was $24.91 for steers fed neither a hormone nor antibiotic, $21.85 for steers fed 12 milligrams of hexestrol daily, $23.22 for steers fed 100 milligrams of aureomycin daily, and just $19.37 for steers fed a combination of 100 milligrams of aureomycin and 12 milligrams of hexestrol daily.

Implantation Advantages

T. W. Perry, Purdue animal husbandman, summarized the ex-

Reprinted by permission from Shorthorn World, Aurora, Illinois

periment on implanted stilbestrol. He told the cattlemen that the method of implanting compressed stilbestrol pellets under the hide at the base of the ear of steers the first day of the experiment resulted in seven per cent greater growth stimulation, six per cent greater feed utilization, and seven per cent lower feed costs per pound of gain than the oral feeding of stilbestrol to the cattle.

At a level of 36 milligrams implanted under the hide, the entire cost of the stilbestrol per animal was nine cents. Animals fed stilbestrol at a level of 10 milligrams per day over a 180-day feed lot period, will consume 1800 milligrams, or exactly 50 times the amount of the 36-milligram implant. At current prices the cost will be 90 cents or 10 times the cost of the 36-milligram implant.

In the Purdue tests, steers fed no stilbestrol gained 2.66 pounds daily, steers fed 10 milligrams orally each day gained 2.95 pounds per day, and steers which received the 36 milligrams of stilbestrol implanted once under the skin gained 3.17 pounds per day.

No objectional side effects, such as relaxation of the loin or raising of the tailhead of the steers in which the stilbestrol was placed under the hide or fed orally, were observed.

Martin Mohler reported on self-feeding various ratios of ground ear corn to Supplement A for fattening cattle. From results of a Purdue experiment, he recommended a ratio of eight parts ground ear corn to one part of Supplement A for cattle feeders who wish to employ the method of self-feeding cattle. The yearling steers fed the 8 to 1 ration gained an average of 2.61 pounds per day during the 161 day trial.

In a report on high moisture ground ear corn, it was reported that while steers fed high moisture corn gained slightly faster, the difference was not significant. However, when high-moisture corn was converted to a low moisture basis as regular ground ear corn there was a definite saving in feed. Cattle fed on the high moisture ground ear corn required 12 to 15 per cent less corn to produce a pound of gain. And there was a three-cent re-

PIGS FOR HOGGING-OFF

To determine the feeder pigs required to hog-off a given area of corn and soybeans, the farmer should estimate his yield of corn, and then figure that 7 bushels of corn with a good stand of soybeans will produce 100 lbs. of pork. Hogs should be marketed when they reach a weight of from 190 to 225 pounds.

duction in the feed cost per pound of gain in favor of the high-moisture corn lots.

On the basis of a comparison of chopped green forage and pasture, the Purdue animal husbandmen opposed the daily chopping of green forage for cattle. They concluded that pasture crops can be utilized more effectively by either grazing, making into silage, or harvesting as a hay crop.

The Purdue animal scientists, however, did say that freshly chopped green corn is an excellent feed for beef cattle during early fall months. Cattle fed on chopped corn (51 pounds daily) plus 3.5 pounds of Supplement A, gained 2.28 pounds daily without an antibiotic.

Tests at Purdue showed that feeding steers on a concrete platform as compared to feeding in the mud increased the daily gain 35 per cent and improved feed efficiency 25 per cent. However, in a dry season when the feed lot was almost free from mud, there was no advantage in feeding on a concrete platform.

Homemade Diagram Helps Adjust Implements

Proper adjustment of row-crop implements is a must for efficient use with modern high-speed tractors.

A fast, easy way to make and check adjustments uses the line-diagram method, says Mike McNamee, Wyoming agricultural engineer. This way machinery is all set alike before it gets to the field, and cultivators will fit the rows made by planters — for sure.

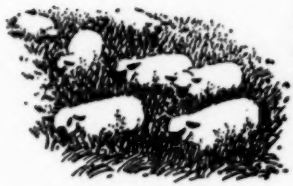
The line diagram consists of lines representing rows and middles. Paint them on a concrete or wood floor or stake them off with wire and nails on a flat, hard dirt surface. Any level space big enough to take a tractor and implement will do.

Make the row lines the same distance apart in the diagram as they are in the field. Then put in middle lines to see where each implement will work when in operation.

Drive the tractor onto the diagram with the front tire on the center line and the rear tires on the two middles. Check the mounted implement to see if it lines up correctly for proper operation.

This adjusting method is useful for setting cultivators, planters, and fertilizer applicators. It is particularly valuable where a farmer uses several types of cultivation on one farm. McNamee says an improperly set planter will cause trouble with adjustment and operation of other implements used after it. —*University of Wyoming.*

More Profits From Farm Sheep



First in a series of articles on breeding, feeding, housing and managing farm flocks. Must reading for every grassland farmer . .

Condensed from Wisconsin Bulletin 470

HERE are some things to consider if you're a beginner in the sheep business — or if you're thinking about raising sheep.

Consider how sheep will fit into your farming. Too often, the beginner doesn't know what he can expect. As a result, his flock may be too small or too large, his breeding and feeding hit-or-miss. In short, his management practices are out of line and the results are discouragingly poor. This may be the reason why sheep are generally speaking, less well cared for than most other livestock.

Do you like sheep—and do you possess even more faith in the future than other livestock men have to have? It's an important qualification for sheep-raising—for all these reasons:

Sheep don't return a monthly income. It takes faith to care for a flock a whole year with only wool and lamb checks to depend on, and these arriving many months apart.

You must have faith, too, in the principle that *good sheep are the most profitable.* This could mean paying twice the price for your first ewes and a pure-bred ram. For greatest efficiency, you should have a one-sire unit (40 ewes).

Faith in the value of a *good breeding and feeding program* is also needed. You'll "flush" ewes and give them proper care at breeding time as a start toward a larger lamb crop. You'll feed liberally in winter for stronger, healthier lambs that aren't in the picture yet but will be at lambing time.

And you'll be going on faith when you forsee that dusting, docking and castrating will return more profit even though marketing is still a long way off; that a definite *drenching program* is necessary, even if sometimes it conflicts with corn to be planted, haying to be done or grain to be combined. Worms are things you ordinarily can't see. You have to have faith that

Reprinted from Wisconsin Bulletin 470, More Profits From Farm Sheep, published April 1956 by University of Wisconsin, Extension Service, Madison, Wisconsin

by drenching at the right time you can increase your return by 25%.

Keeping records is the big trend in all livestock raising today. As a sheep man, it will mean keeping *production records* on ewes and *growth data* on lambs. Through several years and generations, you can grade up a flock just as the cattle man can grade up his herd.

These practices are basic, in today's sheep-raising. It's not so much money or work as *understanding — and believing in — proper sheep management.*

Our country needs more sheep for the new grassland agriculture that will help us conserve our soil. These sheep must be used as labor saving harvesters of forage produced on renovated or cultivated pasture. We must be striving to increase the production of pounds of lamb per acre in the future as we do our other crops.

★ ★ ★

Farmers interested in beginning sheep raising can obtain information on what profit might be expected by checking the labor returns of each ewe kept at the Spooner (Wisconsin) Branch Experiment Station over the past 7 years. This is one of the few sources of such data on any kind of livestock where exact records of expense and receipts are kept. It is of additional value because it is strictly a practical farmer's type of flock managed with very moderate facilities.

In comparing the income from these ewes it should be remembered that 7 ewes and their lambs can be fed throughout the year

PRODUCTION AND LABOR RETURNS OVER A SEVEN-YEAR PERIOD

	1951	1952	1953	1954
Number of ewes in flock ..	82	88	90	85
Number of lambs raised ..	124	140	152	147
Lambing per cent (raised) .	151	159	169	173
Av. wt. of fleece, lb.	9.5	9.0	9.0	7.1*
Price per lb., cents	68.0	56.7	52.3	54.0
Total income from wool ...	$ 720	$ 766	$ 559	$ 463
Price of lambs/cwt.	$ 28-33	$ 15-27	$ 18-22	$ 17-21
Total income from lambs ..	$3943	$2259	$2440	$2498
Total income	$4663	$3025	$3075	$2961
Total expenses	$1915	$1316	$1329	$1459
Labor returns from flock ..	$2748	$1709	$1746	$1502
Labor returns/ewe	$ 33.51	$ 19.42	$ 19.40	$ 17.67
Labor returns/animal unit .. (7 ewes equal 1 cow or animal unit)	$ 235	$ 136	$ 136	$ 124

on the same amount of feed needed for one dairy cow. Also that it required 7 hours of labor for each ewe and only 23% of this labor came during the growing or harvesting season from May 1 to November 1. In addition, very little purchased grain was necessary because the flock was maintained on hay, pasture and grain produced at the Station.

It has been estimated that there are more than 10,000 species of destructive insects in the United States. And the average farmer probably feels he has some of all of them.

This flock was started in 1936 with the purchase of western ewes. Shropshire rams have been used continuously since and the ewes have been selected solely on the basis of production records. The flock is managed by C. O. Rydberg of the Station, cooperating with the Animal Husbandry Department of the College of Agriculture at Madison, Wis.

To arrive at the labor returns from the flock each year all expenses of maintaining the flock, except labor, are totaled. These include the cost of pasture, feed, drenches, medicine, veterinary service, shearing, ram, loss of ewes and cost of marketing wool and lambs. These make up the total expenses and these are deducted from the total income to give the total labor returns as shown in the preceding table. While the feed is mostly home raised, it is figured at current market prices each year. The labor returns per ewe are calculated by dividing the total labor returns by the number of ewes in the flock.

The average labor returns per ewe over this 7-year period was $23.44. Dividing this by the 7 hours of yearly labor required for each ewe means that each hour of labor spent with a ewe in the Spooner flock has returned $3.35.

These values not only give figures with which to compare sheep with other farm livestock, but also emphasize the importance of good sheep management and the income that can be expected as a result. The lambing percentage or lambs raised per hundred ewes is only one example. The average for Wisconsin is approximately 116%, yet the Spooner flock percentage ranged from 151 to 176.

Very few men are wise by their own counsel, or learned by their own teaching; for he that was only taught by himself had a fool for his master.
—Ben Jonson

(To be continued in next issue)

The Soil Bank & Agricultural Act of 1956

Here's what you should know about the latest farm legislation . . . and what you can do to take advantage of its provisions . . .

Condensed from
Michigan Farm Economics

Arthur Mauch

THE Agricultural Act of 1956 will be known as the Soil Bank Act because that is the heart of the new legislation. Yet most of the Act concerned amendments to the basic Acts of 1938 and 1949. Many amendments to the basic legislation already had been included in the 1954 Act. It is the purpose of this article to summarize the 1956 provisions.

ACREAGE RESERVE PROGRAM

The acreage reserve program is a temporary program to reduce production of wheat, cotton, corn, rice, peanuts, and tobacco. Present authorization carries through 1959.

The intended benefits are to: (1) Increase farmers' incomes by direct payments for placing acres in the reserve and by increasing price through lower surpluses and market supplies. (2) Protect against crop failures by basing payments on normal yields regardless of growing conditions. (3) Increase the productivity of idle land for future use. It is hoped that 25 million acres will be placed in reserve. This would be about 7 per cent of the total cropland.

A farmer takes part by signing an agreement with his ASC (Agricultural Stabilization and Conservation) Committee and removing some part of his wheat acreage allotment or corn base acreage from production. Land placed in the reserve may not be grazed, cut for hay, or cropped. It will be left idle or soil or water conservation practices applied to it. Noxious weeds must be controlled.

Wheat land is not eligible if the farmer exceeds his corn base. Corn land, likewise, is not eligible if the wheat allotment is overplanted, unless the allotment is less than 15 acres, in which case a farmer may plant 15 acres and still be eligible for the acreage reserve program for corn.

Reprinted from Michigan Farm Economics, Extension Service, Michigan State University, East Lansing, Michigan

Compensation

In return, farmers will receive certificates which the Commodity Credit Corporation will redeem either in cash or an appropriate amount of the commodity. The payment rate in 1956 is 60 per cent of the support price, or 90 cents a bushel for corn and $1.20 a bushel for wheat, United States average. 1957 wheat also will bring $1.20.

In general the rate is multiplied by the normal yield for the farm if the field is of average quality. Special rules are applied in 1956 but the Secretary of Agriculture has cautioned that the provisions will be different in 1957. Congress set a limit of $750,000,000 a year for the acreage reserve payments, with specified limits for each commodity.

Acres in the reserve may also qualify for ACP payments—but not for conservation reserve payments.

Acreage Limits

The maximum acreage allowed is 50 acres or half the allotment (or corn base), whichever is larger.

The minimum is also important. It must be the larger of 5 acres or 10 per cent of the wheat allotment or corn base.

A farmer cannot put more than his allotment or base in the acreage reserve. If his allotment or base is less than 5 acres he must put all of it in acreage reserve to receive payments.

Historical acreage allotments will not be jeopardized. Acres in the reserve will count as if planted to wheat or corn in future allotments.

Penalty for Violation

A major violation of the Agreement will result in termination of the Agreement and a refund of all payments. For minor violations the Agreement will not be terminated but compensation will be adjusted downward.

CONSERVATION RESERVE

Through the conservation reserve, farmers have an opportunity to receive government assistance for long-term conservation work on their farms. The administration's goal of 25,000,000 acres in conservation reserve, or about 7 per cent of the cropland, would be marginal cropland compared with the acreage reserve.

A farmer may participate by signing a contract with his county committee in which he agrees to remove land from production of crops and devote it exclusively to conservation practices. Land producing tame hay or pasture in regular rotation is also eligible. A farmer must also be in compliance with his allotments or corn base acreage.

Use of Land

A farmer who signs a contract will agree:

1. To establish and maintain protective cover (grasses, legumes, trees or shrubs), water storage, or some other approved conservation practice on designated acres.

2. To maintain normal acreage of conserving and idle land on his farm.

3. Not to harvest any crop from these acres, except timber, in keeping with good forestry management.

4. Not to pasture these acres before January 1, 1959, or a later date cited in the contract, unless the Secretary of Agriculture finds a need for grazing before this date.

5. Not to use any practice defeating the purpose of the contract; for example, divert land now in conservation or woods to a use prohibited by the Secretary.

Practice Payment

A farmer will receive about 80 per cent of his cost of establishing his conservation practice. To establish grasses and legumes, these costs could include land preparation, seed and seedings, inoculation, liming, and fertilizing. To establish trees, costs could include preparing the land, tree seedlings, seed, cuttings and shrubs. Other material and labor used in conservation, including water storage, are also eligible for cost sharing.

These payments do not bar ACP payments for additional protection and improvements on land in the conservation reserve.

Annual Payment

In addition to the practice payment, a farmer will receive payments each year for the length of the contract to compensate him for taking land out of crop and livestock production. The payments will vary with the value of the land for producing crops, rates of land rent in the area, and the necessary incentive to encourage wide participation.

Congress set $450,000,000 per year as an over-all limit for payments for the conservation reserve program.

Length of Contract

The minimum conservation reserve contract is for 3 years; the maximum is for 10 years except for tree cover which may extend for 15 years.

PRICE SUPPORTS

The new legislation did not change the price supports which already had been designated by the Secretary in accord with the 1954 Act. Only in the case of corn is there any relationship between price support and the soil bank.

Corn produced in commercial areas can qualify for the full sup-

port of $1.50 a bushel (86.2 per cent of parity), United States average. In order to qualify for full support a farmer must either (1) plant within his allotment, or (2) reduce his corn acreage at least 15 per cent below his base acreage reserve, or (3) plant within his base acreage and put into conservation reserve other cropland equivalent to at least 15 per cent of his base acreage, or (4) use a combination of (2) and (3).

However, corn prices will be supported at $1.25 a bushel for those in commercial areas who do not meet the above requirements. In non-commercial areas the support will be 82.5 per cent of the full support price or about $1.24.

"You take all the experience and judgment of men over 50 out of the world and there wouldn't be enough left to run it."

—Henry Ford

Corn producers will vote this fall to determine the future program. A two-thirds favorable vote will approve base acreages instead of allotments, compliance as this year with the soil bank, and price supports that will encourage marketing corn in the normal channels of trade but not encourage uneconomic production of corn. A negative vote would return to acreage allotments as a basis for a support between 75 and 90 per cent of parity. Participation in the soil bank would not be required.

The price support for wheat stands as announced at $2.00 per bushel (83.7 per cent of parity). In Michigan it ranges from $1.91 to $2.07. To qualify, a farmer must be within his acreage allotment.

The 1956 crop of feed grains will be supported at 76 per cent of parity, with no limit on acreage. In Michigan this means from $.66 to $.68 a bushel for oats, $1.19 to $1.34 for rye, and $.95 to $1.08 for barley.

Soybeans will be supported at $2.15 per bushel (United States average), which is 75 per cent of the parity price.

Manufacturing milk support prices were set at $3.25 a hundredweight (84 per cent of parity), an increase of 10 cents over last year. Butterfat is supported at 58.6 cents a pound (81 per cent of parity), which means an increase of 2 cents a pound for butter.

The wool incentive program is being continued at 62 cents a pound (106 per cent of parity) grease basis. This year payments will be made for unshorn wool to each producer who owns lambs for at least 30 days, rather than only to those who market for slaughter. The payments will be

based on weight increases of the lambs.

SURPLUS DISPOSAL

The Secretary is authorized to appoint an Agricultural Surplus Disposal Administrator. In order to facilitate a program of orderly liquidation, the Secretary is required to submit to Congress a detailed program for (1) disposal of all Commodity Credit Corporation stocks, (2) a food stamp or similar plan, and (3) strategic stockpiling of agricultural products.

An annual appropriation of $500 million was authorized for Section 32, with a limitation of 50 per cent of this for any one commodity. Section 32, has to do with the use of import fees to buy surplus farm products for domestic and foreign relief. Emphasis here is on supporting the price of perishable products that are not protected by mandatory supports.

A five-member by-partisan commission is to be appointed by the President to make recommendations for increased industrial use of agricultural commodities.

The CCC is authorized to donate commodities to federal penal and correctional institutions and to state correctional institutions for minors.

The President is authorized to negotiate agreements with foreign governments limiting their exports of farm products to the United States.

MODERNIZED PARITY

Transitional parity for corn, peanuts and wheat is frozen for 1957. In other words, the 5 per cent drop toward modern parity will be postponed.

The Secretary is required to make a thorough study of possible methods of improving the parity formula and report to Congress by January 31, 1957.

Evidence Supports Seed Inoculation

Roosevelt Cherry of Waxhaw, North Carolina saw plenty of evidence that it pays to inoculate clover seed. Cherry seeded his pasture last year, but in the process ran out of seed before he finished. Cherry went to a nearby store and bought more seed but was unable to get any inoculant.

Rather than go five or six miles for the material, Cherry returned to his farm and finished seeding his pasture with the untreated seed. Cherry says that it's easy to see where the non-treated seeds were sown.

And he says that in the future, if he has time to sow the seed he will have time to treat them. —*North Carolina Extension*

Farm Machinery Looks For A Cure

The big farm equipment inudustry is ailing. Sales managers say prospects are bright, but . . .

Condensed from Business Week

FOR THE FARM machinery industry right now, it's a little like the morning after. Industry men — except for the always glowing sales executives — give out with such phrases as "lousy conditions" and "abysmally low" production. The story is of high inventories and full pipelines, sliding sales, layoffs, shutdowns—with a few gains here and there in the picture. Even the current upturn in farm income doesn't arouse too much excitement.

Of course, such talk isn't new. The industry has been going through something of a wringing-out for some time, even though production did take a jump in 1955. But the morning-after feeling is worse now because, as one company president frankly puts it, the industry set its 1956 sights too high, and "it has to cut back production further than sales have declined, because we manufactured too much."

So though you can detect what one official calls a "mild spirit of optimism for the immediate future"—the industry is looking for a pick-me-up.

There's talk of merger and of expansion abroad. There are price rises. Men look hopefully —but not too hopefully—to the fourth quarter. Deere & Co. is banking on a complete new line of its John Deere tractors, and is busy showing them off. Massey-Harris-Ferguson, Inc., has a new construction machinery line to offset the farm equipment slump.

But beyond that, the industry is peering ahead for the corner it hopes is there. It's not quite sure just what's around the corner, though (no two companies seem to be wearing the same glasses, and some uncertainties block the view).

Long range, however, the optimism is a lot thicker than for 1956. And there's general agreement that today's wringing out and shaking down is bound to mean changes in the industry.

Glimpses—So far these changes can only be glimpsed—but there are some pointers. The old replacement market that meant replacing the farmer's tired old mules with a tractor is a worked-out vein, industry men agree. Few big, unmechanized farm areas are left. But they see a different market in selling newer, more efficient equipment to replace the old.

They see a growth market, too—not only in the country's natural population growth, but in the changes in agriculture itself. The trend to larger-size farms increases the demand for equipment. And the farm equipment men see the smaller, family-size farms turning more and more to machinery to hold onto their place in agriculture and better their owners' condition.

All this will mean changes in sales methods, in tractor design, perhaps in the manufacturing companies themselves — though no one is ready yet for more than a guess, or a salesman's vision, of what the changes will be.

1. Near View

But to get to that "tremendous" future market, the industry has to start almost from scratch. And it has to get around that 1956-57 corner before it can see very far ahead. Just how far it has to go you can see in the fact that right now there are 11 used tractors sold for every 10 new ones.

Here are just a few samples of what's happening. International Harvester Co. expects farm machinery sales for its current fiscal year (ending Oct. 31) will be about $60-million under last year's $385-million. Harvester plans more lay-offs, but looks for some sales improvement in the current quarter.

Minneapolis-Moline Co. is ending production at two outmoded plants. J. I. Case Co. is consolidating operations. Six important Wisconsin manufacturers have let 3,400 workers go.

One bright spot seems to be at Ft. Atkinson, Wis., where James Mfg. Co. says it's hiring and has sales running ahead of 1955. James is a specialist in heavy barnyard machinery. (In general, tractors seem to be hit the worst; but though tractors are the biggest single item, you can't overlook the 60% of farm machinery dollar sales that's accounted for by implements.)

Rising costs—steel among other things—make a further general price rise likely. International Harvester, for one, has announced a 5% across-the-board increase effective Sept. 15.

2. Distant View

To many farm machinery men, though, the distant view seems clearer than what's just around the corner—perhaps because any

obstacles don't loom so close. Pres. MacFarlane of Minneapolis-Moline, for example, sees the industry cautious now about increasing production, with the result that "I can see a machinery shortage in about three years."

Irving A. Duffy, vice-president and general manager of the Ford Tractor & Implement Div., thinks farmers are being weaned to a new concept of farm operation that will give a big boost to mechanization and machinery sales.

Model Changes

There's little agreement in the industry, however, about how it's going to go after the market it sees in "putting better machinery onto already mechanized farms." The industry's present plight resembles Detroit's, so perhaps it's natural to think of Detroit's ways of winning customers with model and style changes and "planned obsolescence."

Farm machinery men, already thinking along that line are turning to it again. Says a Deere official: "The domestic farmer needs and will need more machinery, and some of it isn't even invented yet." There's talk of torque converters, automatic transmissions, power steering as standard equipment for the future with new models coming out at least every three years, instead of every six or eight.

But there are limits in farm equipment changes that Detroit doesn't face. Volume is smaller, and evolution of farm machinery is more gradual. It's not uncommon, a Harvester man points out, for a basic tractor to be in production eight or nine years. Improvements center around one feature, rather than coming in a radical annual change.

The farm equipment industry might take a leaf out of Detroit's book of sales gimmicks, too, but so far there's little sign of a change in selling methods. With about 4.28-million tractors in service, 10% of that figure ought to be the peak annual replacement market, according to W. G. Scholl, executive vice-president of Allis-Chalmers; but this year the industry will hit around 5%. There's no formalized trade-in system worked out, or planned.

Many believe that better financing arrangements are vital. Ford's Duffy holds that the key to the future of the farm machinery business lies in selling farmers on long-term depreciation of machinery.

Fewer and Bigger? Some industry observers see a change coming in the industry itself. Old plants now being shut down may never be reopened, they say, and a lot of obsolete manufacturing capacity is likely to be junked.

Others are convinced that the small company just can't survive, that mergers are bound to come.

Fence Post Facts

Selection of the right kind of wood for fence posts is of importance . .

Condensed from New England Homestead

James H. Lawrence

WHILE methods of fencing may change considerably as new approaches to feeding, pasturing, and other problems are devised, it is generally agreed that the wooden fence post will long continue to be a familiar part of the farm scene. Thus it is as important today as it was yesterday—that fence post selection and care be done wisely, with one thought uppermost—that you are getting the most for your money and effort in the long run and the best service possible from your posts.

Among the most important considerations in the selection of wooden fence post materials is the kind of species to be used. Some tree species stand up considerably longer, are more easily obtainable, and are less difficult to handle than others. Considering the point of durability, based on the estimated life of the species' heartwood, Table I shows various species used on New York farms with their expected life duration as compiled by foresters at Cornell University.

Another consideration is the cost of the fence post. What is the true cost? According to Professor L. S. Hamilton, a forester at the New York State College of Agriculture, the initial cost of a fence post may often blind

TABLE I

Estimated Life Duration Of Fence Post Species

20 Years	10-20 Years	5-10 Years	Not Over 5 Years	
Red Cedar	White oak	Slippery elm	White ash	Ironwood
Mulberry	Swamp white oak	Black cherry	Red oak	Black Birch
Osage orange	Honey locust	Butternut	Black oak	Yellow Birch
Black locust	White cedar	Sassafras	Red maple	White Birch
		Rock oak	Hickory	Basswood
		Hemlock	White elm	Tulip tree
		Tamarack	Popple	Red Pine
		European larch	Beech	Scotch pine
			Sycamore	Norway spruce
			Sugar maple	

Reprinted by permission from New England Homestead, Springfield, Mass.

you to the real cost. Professor Hamilton points out that the real cost is most adequately given by the cost per post per year in service. He explains that since the labor cost of replacing posts is so high these days, it is extremely important to be aware of the true costs for those materials most commonly used. For when this yardstick is considered, the material which costs the most in the beginning may be the cheapest in the end. Table II shows the relative true cost of fence posts as compiled by the forester.

"In presenting these approximate figures," explains Professor Hamilton, "a six-foot post with small end diameter of 3½ to 4 inches has been considered as typical. A cost of installation of 25 cents for everything except the steel post, has been used. The installation cost for the steel post was set at 10 cents. The life expectancy for white cedar is the average reported for the small round posts which are currently available from post dealers."

If posts from recognized long-life species like black locust cannot be obtained, then treated posts should be used. Moreover, fence post preservatives are gaining more and more widespread acceptance, mainly because such treatment makes possible the economical use of home-grown material otherwise discarded for posts. In selecting a preservative, choose one that is safe, reasonably inexpensive, penetrates the wood readily, is non-corrosive to metals, does not wash out of the

TABLE II

True Cost Of Fence Posts

Type Of Post	Cost of post in ground	Expected life in years	Cost per year (dollars)
Steel	$1.10	15-20	.05-.07
Black locust (split heartwood)	.75	30	.02-.03
White cedar (average post with little heartwood)	.70	7-10	.07-.10
Pressure treated (creosote) pine	1.25	25-30	.04-.05
Common non-durable species (ash-beech-maple)	.50	3-5	.10-.17
Pine or oak treated at home with oil soluble preservative	.85	15-20	.04-.06
Many common woodlot species with water soluble preservative	.70	10-15	.04-.07

wood easily, can be handled without too much difficulty right on the farm, and is poisonous to wood-destroying fungi. Oil-soluble preservatives, with slight exceptions, pretty much fill this bill and are used where well-seasoned, bark free posts are to be treated. For fresh cut posts with the bark on, water-soluble chemicals are recommended, such as chromated zinc chloride and copper sulfate.

So, in general, good service may be expected from your fence posts when care is taken to select a longlife species or preservatives added to increase durability, and the selection is made on the basis of getting the most economical post in the long run.

New Agricultural Yearbook Covers Animal Diseases

The 1956 Yearbook of Agriculture, "Animal Diseases," covers the subject from cattle and sheep to rabbits, cats, minks, and foxes.

The book contains 134 chapters by leading veterinarians and other scientists, most of them in the U. S. Department of Agriculture and state colleges.

It emphasizes diseases and parasites of cattle, swine, sheep, goats, poultry, dogs, cats, horses, mules, rabbits, minks, foxes, and other animals. Chapter authors describe in detail the causes, symptoms, treatment, management, and modes of transportation.

Introductory sections contain chapters on food supplies and animal diseases, infectious diseases common to animals and man, causes of disease, genetics and disease, protection against transmissible diseases and parasites, veterinary biological products, antibiotics, sulfa drugs, and other drugs.

The yearbooks have been published for more than 100 years as required by law. They are Congressional documents produced in the Agriculture Department with appropriations from Congress. Members of Congress distribute nearly all copies.

The Superintendent of Documents, Government Printing Office, Washington 25, D. C., has copies available at $2 each. The USDA and extension services have none for general distribution.

Wyoming Extension

A New, Easy Way to Treat Fence Posts

About a new process developed by Forest Products Laboratory at Madison, Wisconsin . . .

Condensed from Successful Farming

YOU CAN protect your fence posts against decay and termites by a simple soaking process. The new process was developed by Forest Products Laboratory of the Forestry Service at Madison, Wisconsin.

By standing the round green posts first in a water solution of copper sulfate and then a water solution of sodium chromate, the two chemicals diffuse into the post and combine to form copper chromate. This combination is toxic to fungi and insects, practically insoluble in water, and will not leach from wood placed in a damp soil.

Of 100 pine posts thus treated and set in 1942 in Mississippi, only one has decayed. This is a region of high decay and termite hazard where the average life of untreated pine posts is about 3 years. The average life of hardwood posts also has been extended considerably by this treatment. The method shows promise of wide application for preservation of wood for farm use.

Equipment needed to carry out this treatment is commonly found in most homes: A scale to weigh the chemicals or a 1-pound coffee can, a 10-quart pail, and 2 barrels, one of which must be wooden or concrete. The 25 pounds of copper sulfate crystals and 25 pounds of sodium chrome powder needed usually can be ordered through a local hardware store. If not, the laboratory at Madison, Wisconsin, has a partial list of companies handling the chemicals.

The Forest Products Laboratory recommends that no less than 50 posts be treated at a time. Posts should be cut 6 inches longer than needed and treated as soon after cutting as possible. They should be peeled just before they are put in the copper sulfate solution.

Copper sulfate is corrosive, so must not be mixed in an iron container. A wooden barrel or concrete or earthenware container can be used. To 20 gallons of water add 18 pounds or about 7 coffee cans of copper sulfate crystals. Stir until they dissolve. Less stirring is needed if they are added to the water the day before the solution is to be used.

Cut off 6 inches from the large

Reprinted by permission from Successful Farming, Des Moines, Iowa

end of each post and stand in the solution cut end down for two days. The area of the post which will be in the ground should be surrounded by the liquid. To prepare extra solution, add about 2/3 coffee can of copper sulfate crystals to a 10-quart pail of water.

The posts are then transferred to the second solution made by slowly stirring 18 pounds or about 6 coffee cans full of powdered sodium chromate into 26 gallons of water. This chemical dissolves readily. Keep the posts in this solution one day large end down. If additional solution is needed, add 2/3 coffee can of sodium chromate powder to a pail of water.

Posts can be used at once, but it is better to pile them close together for several weeks. This rest period helps distribute the chemicals more evenly through the posts. If they are to be used soon, it is advisable to rinse them.

The solutions should be fortified before the treating of each new set of posts. To the copper sulfate mixture add enough water to bring it to its original level and 3 pounds or 1 heaping coffee can of the crystals. For the sodium chromate solution, add water to bring it to its original level and add 3 pounds or 1 level coffee can of chemical.

The chemical solutions are harmful if taken internally, so children and animals should be kept away from them. Persons handling the posts during the treatment process should wear rubber gloves to avoid possible irritations. When the treating process is complete, the chemicals should be dumped into a hole some distance away from wells or livestock ponds. After the chemicals have seeped away, the holes should be filled with dirt.

A couple of sailors laying over a day or two in Sweden decided to go to church. Knowing no Swedish, they figured to play safe by picking out a dignified-looking gentleman sitting in front of them and doing whatever he did.

During the service the pastor made a special announcement of some kind, and the man in front of them rose. The two sailors quickly got to their feet, too—only to be met by roars of laughter from the whole congregation.

When the service was over and they were greeted by the pastor at the door, they discovered he spoke English and naturally asked what the cause of the merriment had been.

"Oh," said the pastor, "I was announcing a baptism, and asked the father of the child to stand."

—Better Crops.

Artificial Insemination - Big Boon to the Dairyman

One of the biggest things that ever happened to the dairy industry, that's artificial breeding. Sire selection is still a problem . . .

Condensed from The Furrow

Ralph Hughes

WITH the exception of hybrid corn, perhaps few if any practices have been more widely or more rapidly accepted by American farmers than has artificial insemination of dairy cows. In just 17 years, the number of dairy herds using this relatively new breeding method has skyrocketed from 646 in 1939 to nearly 600,000 in 1955.

Last year approximately 5½ million dairy cows were bred artificially with semen collected from 2,450 bulls. That's an average of 2,040 services per sire. In 1939, only 33 sires were available for artificial breeding and they averaged 228 cows each or a total of 7,539 cows bred artificially that year.

The U.S.D.A. reports that a record number of more than 1,500 artificial breeding organizations were in operation in the United States in January 1956—located in nearly every state, and in Alaska, Puerto Rico, and Hawaii as well. Last year, there were 24 states each with 50,000 or more dairy cows artificially bred. Wisconsin again topped the list with 1,000,293, and Minnesota, Pennsylvania, and New York each reported well over 425,000.

What brought about this tremendous growth of artificial insemination? We visited two of the nation's largest bull studs, corresponded with university specialists in the big milk-producing states, and talked with nearly a dozen dairy farmers who have bred their cows artificially for over 10 years. This is what we learned:

Increases Production

Through artificial insemination, a dairy farmer can choose from a wide selection of sires. And, in most cases, he can use sires of a caliber the average dairy farmer cannot afford to own. During the last 10 years, A. S. Hallock of Laceyville, Pa., has not had a bull on his farm, but he's used nine different sires of

Reprinted by permission from The Furrow, Moline, Illinois

the Northeastern Pennsylvania Artificial Breeding Cooperative. He now has no more than two daughters of any one bull in his herd.

Before Hallock bred his cows artificially, his herd averaged 12,197 pounds of milk, testing 3.65 per cent and yielding 445 pounds of fat—far better than the national average. In 1955, his herd averaged 13,997 pounds of milk, 4.13 per cent, and 577 pounds of fat. This is an increase in production of approximately 15 per cent for milk and 30 per cent for fat.

Herbert and Oren Bastian who own and operate a dairy farm near Hinckley, Ill., started breeding their Holsteins artificially in 1942. At that time, their herd averaged 9,653 pounds of milk and 340 pounds of fat. Currently, their herd averages 12,421 pounds of milk and 502 pounds of fat. They have had an increase in production of 2,768 pounds of milk and 162 pounds of fat.

We do not suggest that this increase is due entirely to artificial breeding, nor do the Bastian brothers. Good management and proper nutrition probably account for more than half of these increases. "However," Herbert Bastian remarked, "by breeding our herd artificially, we have a choice of more than a dozen outstanding sires. We no longer have to take the risk of buying a bull just to find out that he is not satisfactory."

The Bastian brothers now have five generations of artificially sired animals on their farm. One of their young cows recently established the second highest H.I.R. record ever made in Illinois by a senior 2-year-old on twice-a-day milking.

Improves Type

In addition to increasing production, the various qualities of good-type can be introduced through artificial breeding. An outstanding example of this can be found on the Clanyard Farm in Kane county, Ill., where the entire dairy herd is under an artificial breeding program. Manager Russell Mathews makes this comparison of three generations of cows:

The granddam classified "good plus" in type and made a record of 12,350 pounds of milk and 498 pounds of fat. The dam (sired artificially) classified "very good" and made a record of 17,330 pounds of milk and 739 pounds of fat. The daughter (sired artificially) classified "excellent" and made a record of 20,188 pounds of milk and 776 pounds of fat. In each generation, there was an improvement in type and an increase in production.

Not all the credit for improving type and increasing produc-

tion should go to artificial breeding. Much credit is due to outstanding herd management and wise selection of the proper sires. However, it should be remembered that even the best herdsman or most experienced geneticist cannot accurately predict the characteristics of the progeny from the mating of any two animals. This is because there are too many possible genetic combinations.

I don't know what your destiny will be, but one thing I know: the only ones among you who will be really happy are those who will have sought and found how to serve.

—Dr. Albert Schweitzer

Many artificial breeding organizations, in the past, have had to rely on the same general methods of selecting sires that any individual purebred breeder uses. In fact, many of the sires in artificial use today are chosen by experienced and successful purebred breeders who are members of sire-selection committees.

The daughter-dam comparison is an important criterion for selecting suitable sires, although some scientists do not consider it to be the best available. Conditions under which the records were made are equally important.

Many dairymen think that it is better to prove a sire through artificial insemination than through natural breedings. Their reasoning is this: A sire proved artificially will have daughter-dam comparisons in more than a dozen herds, under probably that many different feed and management systems. A sire proved naturally is usually restricted to breedings in just one herd; therefore, his daughter-dam comparisons reflect production increases obtained under only one type of feed and management. That same sire may "fall flat" in another herd because of poor feed and management.

Type is also considered although, at present, breeders do not agree on the extent of correlation between type and production. At least, a sire needs to be an acceptable individual according to type. After all, people come to look at him at the bull stud. Then, too, his offspring will be sold generally on the basis of type until they establish records of their own.

Costs Less—And Safer, Too!

A third reason most commonly given by farmers for switching to artificial insemination is that of saving labor, feed, and barn space, by eliminating a herd sire; also eliminating the hazard of handling a bull. John and Pete Stewart of Union county, Miss., put it this way: Breed your herd

artificially and give the herd sire's space to a productive cow. Then, too, there's less chance of spreading disease from one cow to another.

Cornell University came up with some interesting figures on the cost of keeping one dairy bull for a year:

Average per bull	Dollars
Costs:	
Labor	67.52
Feeding and bedding	123.06
Depreciation and interest on value of bull	44.14
Buildings	27.83
All other costs	11.34
Total cost	273.89

Even crediting the bull yith $11.15 worth of manure, it still cost $262.74 to maintain a herd sire for one year.

Each bull in Cornell's survey was used an average of 26.5 times during the year—or at a cost of nearly $10 per service. Most organized bull studs charge much less than that, and—in marked comparison—there is the experience of 12 dairymen in Grady county, Okla., who purchased frozen semen from the Eastern Iowa Artificial Breeding Association of Cedar Rapids, Iowa. They did their own inseminating at a total cost of only $2.50 per calf.

Early Troubles Overcome

At first, it was thought by many farmers that low cenception rates would keep artificial insemination from being successful, but the scientists have nearly whipped that problem. In fact, conception rates via leading bull studs are equal to, or better than, conception rates by natural mating.

Not only have scientists improved their methods of collecting and preserving semen, but they have also set up methods of evaluating each inseminator's work. With records made on rapid, electronic calculating machines, supervisors can trace one collection of semen to all the inseminators who used it. Then they can compare the conception rates obtained by each inseminator, taking into consideration hot weather conditions, number of days delay in using semen, and method of handling (whether fresh or frozen).

At the Northern Illinois Breeding Co-op, IBM machines are used to tabulate such helpful information. Also, in the same way, the breeding records and performance of each sire in the stud can be kept up-to-date. Take Ty Vic, one of their most popular sires, for example:

Ty Vic semen has been used on 40,000 cows. He has 482 tested daughters averaging 12,-691 pounds of milk and 493 pounds of fat. He also has 80

daughter-dam comparisons:
80 daughters average
13,490 lb. Milk....528 lb. F
80 dams average
12,193 lb. Milk....441 lb. F
Increase
1,297 lb. Milk.... 87 lb. F

Still a Long Way to Go

All this sounds good for artificial insemination — but should not give the impression that the A. B. organizations are ready to rest on their achievements. Instead, many of the bull studs are currently undergoing very critical self-analysis.

For example, at the New York Artificial Breeders Co-op, the supervisors are revising their methods of selecting herd sires. R. W. Bratton of Cornell University puts it this way. "When sires were used artificially on 2,000 cows per year, a better than average bull was satisfactory. But now, when it is possible to breed as many as 35- to 40-thousand cows to one sire each year with frozen semen, that sire must be outstanding in every sense of the word."

NYABC now plans to start with 30 to 35 young bulls every year in hopes of obtaining 10 or 12 really outstanding candidates for replacing present sires. These young bulls will be proved artificially because bulls proved naturally in individual herds have frequently turned out unsatisfactory.

The young bulls will be bred to 2,000 or 2,500 cows, then "turned out to pasture" until at least 50 daughters with records are obtained. This represents a big investment as the sires will be 6 or 7 years old before they are put into the regular breeding program. Then, of course, probably two-thirds will be culled for not coming up to the extremely high standards.

Considerable progress has been made in artificial insemination—but much remains to be done—and all of it should benefit the dairy farmer.

U. S. Ranks High In Wool Per Head

The United States now ranks third in the average amount of wool clipped per sheep, says Ivan Watson, New Mexico A & M College. The average clip in this country is now 9.9 pounds per head, compared with 10.1 pounds for Australia and 12 pounds for New Zealand.

Australia leads the world in sheep numbers with a total of 131 million head. Argentina ranks second with 53 million, and New Zealand third, with slightly over 39 million. Sheep numbers in the United States have been decreasing for many years. Today, the country has 31 million head. —*New Mexico A. & M.*

Cut Your Turkey Feed Costs with Milo

A saving in production costs of four cents per pound was obtained by these Missouri turkey farmers . . .

Condensed from Turkey World

Ray Freedman

MILO maize can be used to cut the cost of producing turkeys. A partner team of H. V. Moreland and Leonard Reavis, who operate a turkey farm near Crane, Missouri, have proven what it can mean with last year's flock of 12,000 birds.

One-half of the flock consisted of Broad Breasted Bronze. The Broad Breasted Bronze poults went into the brooder house on May 13. On May 15, the partners started planting the milo, finishing by the end of May. The Beltsville White poults went into the brooder house on June 10—four weeks later than the Bronze.

The milo was seeded at the rate of six pounds to the acre, and fertilized with 125 pounds of 4-12-4 fertilizer. The early seeding got off to a good start because of good moisture conditions. Later plantings didn't fare so well because of the lack of moisture.

Milo doesn't take too much moisture, but requires a lot while it is coming up.

The Bronze turkeys were moved into the milo when they were 15 weeks old, just as the grain was beginning to ripen. The Beltsvilles, and the few Bronze that were included to fill out the late order, were moved onto the milo range when they were 11 weeks old. Disease control was expedited by keeping the two age groups separated.

Pellets and oats were kept in the feeders at all times. This included before and after the birds were moved into the milo. The partners, adhering to the best turkey production methods, were well aware that an abrupt change of feeding habits of the flock likely would cause loss of weight, if not the loss of some of the birds, before they harvested the grain, so they used the utmost care.

Since picking is a traditional habit of turkeys, they soon were ranging out into the ripened milo. They cleaned the seed heads as they foraged. They even ate the broad-bladed foliage of

Reprinted by permission from Turkey World, Mount Morris, Illinois

the plant, and did a fairly good job on the stems.

It wasn't long before they were harvesting the crop at the rate of 10 to 15 acres every week. Once a field was cleared, the fenced-in area was moved back to include another 10 to 15 acres. This was an every week ritual. The feeders and waterers, likewise, were moved to the new range, along with the turkeys.

A farmer bought a parrot for $25 at an auction sale. When the sale was over, he asked the auctioneer: "Does this bird talk intelligently?"

"You ought to know," said the auctioneer. "He's the only one that was bidding against you!"

—Montreal Star

Of interest is the fact that, while the Beltsville Whites were consuming some 2,000 pounds of feed a day during their last weeks of growth, the Bronze used about 2,500 pounds. This 2½ tons of daily feed for the total flock however, was over and above the milo and green forage.

Corn was added to the ration the last four weeks of feeding. "This wasn't really necessary," Moreland pointed out. "Another year, and we will depend entirely upon the milo."

"Milo is 90 per cent as fattening," Reavis added. "The birds were ready to be marketed—two weeks earlier than we expected."

The birds were contracted to be picked up, when the Bronze were 26 weeks old, by a large produce company in Kansas City. Instead, they were ready at 24 weeks. The Bronze toms weighed from 24 to 26 pounds each; the hens, 16 to 18 pounds.

Moreland and his partner were jubilant over the success of their venture. They credit it largely to the fact that there was plenty of milo at hand when the birds needed a fattening feed. The grain ripened at a time when it was needed most. Milo stands up well, too, Reavis said. "There is no waste from wind, rain, or tramping-down. The seed heads don't shatter, no matter how ripe, as in the case of some other grains.

More important, perhaps, is the fact that the savings in feed costs is not to be passed over lightly. They estimate (conservatively) that the milo saved them four cents on every pound of live turkey produced. This would be 40 cents saved on a 10-pound Beltsville and an even dollar on a 25-pound Bronze tom. When a total savings of some $8,000 is realized on a flock of 12,000 turkeys, even a veteran turkey grower will grant that that's quite a stroke!

New Pastures from Old

Pick your site. Check your costs. Don't skimp on fertilizer . . .

Condensed from
Breeders' Gazette

Jerome K. Pasto and *Guy W. McKee,* Pennsylvania State University

WHEN feed is short, production of meat and milk is shorter still. But rejuvenated or tall-grass pasture produces several times more feed than run-down permanent pasture. Besides, it is more palatable, and more productive during hot spells. This increased carrying capacity explains why many stockmen are rebuilding old pastures.

However, the cost of renovation is often high. So consider carefully the site you wish to restore, and the place improved pasture can fill in your overall roughage program.

To discover how much it actually costs to make new pasture out of old, we talked to 25 Pennsylvania farmers who recently put this idea into practice. We inspected the renovated sites and took soil samples. Then we figured the cash cost of renovation —including money for bulldozer hire, fuel for the farm tractor, fertilizer, lime and seed. The farm labor, which ran 7 to 78 hrs. per acre, was not included because this work can be done in slack time. Cash cost was as low as $17 and as high as $108, but neither used enough lime and fertilizer.

The soil tests told us the amount of fertilizer and lime needed to bring fertility and soil pH up to the levels recommended by the experiment stations. We figured that cost too, because most farmers had not used enough to get good stands.

We learned that the big items of cash cost are the amount of clearing necessary and lime required. Average costs don't mean much. So we set up 3 typical sites for you — covering three common situations: An "easy site" is about like cropland which hasn't been worked for several years; little or no brush, few rocks or none. More work to rebuild is the site with up to 50% cover of briers, brush and trees under 3"; some rocks, bulldozer needed in spots. A "difficult" site to make over is more than

Reprinted by permission from Breeder's Gazette, Spencer, Indiana

half covered with brush and trees; some rocks, often hilly.

Based on the experience of these 25 farmers, we figured cost of rebuilding these typical pasture sites. This will give you a good idea of what it will take to create an acre of improved pasture on your place. Use the seeding mixture and fertility program recommended for your area. Lime may be cheaper where you live, or you'll need less.

Most of our farmers used manure in their pasture-repair program. This farm-produced fertility is not a cash cost. However, it stimulates growth of grasses which crowd the legumes. So we give you two fertility programs —either with or without manure.

How to Figure Renovation Cost per Acre

Clearing. Bulldozer hire at $12 per hour. **Nothing** on easy site; **$36** on site with some brush (under 50%) and rocks; **$72** on difficult site (more than half brush cover, rocks, hilly). Gas & oil for tractor: brushy site, **$1.20**; difficult site, **$2.00.**

Land preparation. Gas & oil for your tractor—picking stone, spreading manure or fertilizer, preparing seedbed and seeding: **$5.20** on easy site; **$7.20** brushy; **$7.60** difficult site.

Ground limestone. At $8.50 per ton, spread: **$17** on easy acres; **$25.50** on others.

Fertilizer. Either 8 tons manure with 500 lbs. 0-20-0 at $34/t.— **$8.50. Or** 500 lbs. 0-25-25 at $72, plus 300 lbs. 5-10-10 starter fertilizer at $48 — **$25.20.**

Seed. 1½ bu. oats at $1.50— **$2.25. Either** 1 lb. ladino clover, 5 lbs. orchardgrass, 5 lbs red clover—**$5.40. Or** 6 lbs. birdsfoot trefoil, 4 lbs. timothy—**$11.30.**

If you use **manure** and seed **ladino,** it works out like this (for **birdsfoot** add $6; using **fertilizer** instead of manure add $17):

Easy Site	Some Bulldozing	Tough Site
$38	$86	$123

These are 1955 cash costs. Adjust for your own lime, fertilizer and seed requirements.

Does Renovation Pay?

Ground cover of desirable grasses and legumes on the revived pastures jumped from an average of 10% before renovation to nearly 70% afterwards. All but one of the farmers we visited were well satisfied with their renovated pastures. Most intend to make over more pasture. Half have increased their herds now they have better pasture.

Grassland farming is *livestock* farming. It calls for know-how in both crop and livestock management. Equally important is understanding how to *work the two together* for most profitable results. Improved pasture can be a money-maker when efficiently utilized, will be wasted effort if poorly handled.

Work out a well-rounded production - and - use program for your farm. Each phase is important, so try to keep the whole thing in balance. For example, Oscar Hohn, Susquehanna Co., added a few cows to his herd,

but soon discovered he was short of hay for his 35 Holsteins. He had to buy some several winters in a row. So he set out to improve his meadows—liming, fertilizing, and selecting adapted legumes and grasses. He also improved some pasture. No use feeding weeds in summer and good hay in the winter, he figured; cows do best well-fed the year 'round.

Those pastures now produce enough so his cows can stay at cruising speed and still get a rumen-full. And he *uses* every bit of grass he grows. Extra spring pasture goes into the silo, to be fed out in late summer when pastures are short. Then the silo is filled again with corn or grass for winter feeding.

Choose a site that has potential —avoid steep, grownup, rocky or wet soils. *Test the soil* before renovation, and then follow recommendations. Protect the new pasture until it is established. *Follow through* with controlled grazing, clipping, lime and fertilizer. *Ensile any excess* spring pasturage for summer use, or make it into hay.

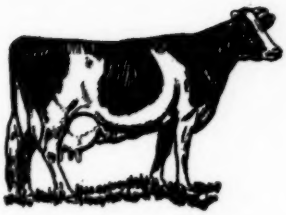
Artificial Breeding Aids Disease Prevention

Artificial breeding of dairy cattle has many advantages — among them prevention of genital diseases, says Dr. S. L. Kalison, Virginia veterinarian.

Of this group of diseases, trichomoniasis and vibriosis are spread primarily by natural service. Adding antibiotics to semen, particularly streptomycin, makes it incapable of spreading vibriosis. The technique of insemination reduces the possibility of spreading trichomoniasis to a minimum.

Breeding the entire dairy herd artificially with semen from bulls free of trichomoniasis to which antibiotics have been added eliminates these two diseases as possible causes of reproductive failures. Semen that meets these requirements is available to dairymen in most areas.

More familiar to dairymen is the improvement in production and type that results from the use of artificial insemination. This is a proved fact, and indications are that it may even exceed original expectation, Dr. Kalison says. —*Virginia Extension*



Milking Experiences at Harden Farms

An expert gives us the benefit of his long experience . . .

Condensed from Holstein-Friesian World

E. S. Harrison

AS THE milking machines replaced the hand milkers at Harden Farms we, like many other herders, were to discover that the machine did not solve our milking problems. The milking machine did not remove the human element and we quickly learned that regardless of make it was no better than the operator.

In the early years we had a team of two men operating three single units. Production was unsatisfactorily low with wide daily variations. Udder trouble was common. Both men refused to accept the responsibility for the trouble and each insisted that he was doing a good job. The only solution was to break up the team and give each man a string to milk and to be responsible for. Accordingly the cows were divided equally and each milker was limited to a single unit. They protested loudly arguing that they would never get through milking. They were amazed, however, when within ten days they had reduced their milking time. Production increased and our udder trouble decreased to a point where it was no longer a problem.

As helpful as this change proved to be we soon learned there were still other problems to be solved.

A Conflict of Personalities

Dairy cows are living animals that vary widely in temperament, in disposition and in their responses. The successful machine operator like the successful hand milker must learn to know the cows he is working with. Knowing them he can frequently avoid a conflict between himself and his cows. I realize this may sound ridiculous to some but actually conflict between a milker and a cow is not uncommon. Whenever we discover such a conflict we try to transfer the cow to another milker's string. Just recently a very promising two year old in one of our best milker's string was falling far

Reprinted by permission from Holstein-Friesian World, Laconia, N. Y.

short of our expectations. She was transferred to another milker and within a few days she had increased 14 pounds of milk per day. She has held this increase very uniformly for over 2 months. Keep in mind that the transfer was made after she had been in milk for 3 months which was well past the stage when any increase would normally be expected.

With first calf heifers the first few milkings represent a very critical period. We like to feed a heifer just before milking so that her attention is diverted. Extra care should be used in stimulating the milk let-down. Never move quickly and do everything possible to quiet her and to prevent her from becoming excited. Whenever possible it is best to have the second man present to push the tail up to discourage kicking as the machine is put on. Under no conditions should the milker leave her from the time the machine is put on until it is removed. If one is able to complete the first 3 or 4 milkings without mishap the battle is usually won. On the other hand if she becomes excited and kicks the machine off it may take weeks to quiet her down and sometimes they never entirely get over being nervous and excitable.

A few years ago we had quite an outstanding four year-old complete a record, over 25,000 pounds of milk. When she calved as a five year old she was in exceptionally good condition and was really ready to go. In an attempt to give her every possible opportunity we assigned her to our best milker, a milker who in the past four years with us has completed 23 records over 1000 lbs. fat. For some reason they just never got along and she failed by 3,000 pounds of equalling her 4 year old record. The following year under another milker she produced over 29,000 and the next lactation over 30,000 pounds. The significant thing is that this conflict occurred with a top milker, a man who takes pride in his work and derives great personal satisfaction out of completing a good record. It is serious enough when only one cow is involved but think what can and does happen with a milker who doesn' care and is rough with his cows? Such a milker may easily lower production by as much as 2000 pounds per cow. Multiply this figure by the number of cows he milks and by the price of milk and you approach the sal ary of a good milker.

A Cow Must Be Ready to Milk

About 4 years ago we had a young man join the Harden Farms family. He possessed a very pleasing personality with all the enthusiasm of youth. His interest was genuine and we put

him in charge of one of our small test barns. He failed to measure up to expectations. His cows would reach a peak and then almost immediately start on a downward trend in production, a trend that continued uninterrupted until many of his cows were dry long before they should have been.

Actually his cows were producing from 2000 to 4000 pounds less milk than we had reason to expect on the basis of their past performances. Our problem was real and serious enough to command immediate action. We were faced with the choice of finding the cause of his trouble and correcting it or replacing him. He was not the kind of employee that anyone wishes to replace so we began to look for the cause. After careful observation of his milking practices we concluded that he was not getting his cows ready to be milked. As a result the machine was on the cows nearly a minute before there was any milk let down and there never was a complete letdown. This meant that the machine had to be left on too long and that even then there was a lot of stripping to be done. This was becoming a vicious cycle because the more he stripped the more he had to strip.

Each one thinks the current in which he lives is the whole ocean.

We explained to him the role that stimulation played in causing the hormone responsible for milk let-down to be released. He was provided with a sponge with which to wash the udder. The theory being that the sponge would hold enough hot water to really stimulate the udder. The udder was then dried with a cow-towel that could be discarded. With a plug-in disc electric water heater he was able not only to keep the water hot but to change it often enough to keep it clean.

This made the difference. The downward trend in production on the cows milk was checked and the fresh cows added to his string began to reach new highs and to maintain their production for substantial periods. He continued to check his cows after removing the machine but discontinued prolonged stripping. Since making this single change in routine he has completed many outstanding records. We now rate him as a very valuable employee. He is happier because he has cut about 30 minutes off of the milking time for each milking and he has the personal pride in his work that comes from the satisfaction that grows out of the knowledge that he is doing a good job.

Milking Is A Full Time Job

The man who thinks he is saving time by feeding the calves and doing other chores while the machine is milking a cow is only kidding himself. He is not saving time but he is doing a poor job. We had a milker who seemed to be in a hurry to get through. As soon as he hung the machine on his last cow he busied himself with cleaning up and putting away his equipment. Warning did little good and he had to learn the hard way. The lesson wasn't long in coming because within a few weeks he was in serious trouble with her udder. We finally solved the problem by having him milk her last by hand.

A large percentage of all udder trouble starts during the drying off process. Once the udder becomes infected it seems to be predisposed to periodic flare-ups every time any unfavorable conditions exist in the future.

The persistent producing cow that is still producing a good flow of milk when it is time to dry her off presents a real problem. Time is an important factor. We skip a few milkings and then milk her dry. Each quarter is then treated just as though she were in trouble. We then let her go unmilked so long as the udder doesn't become dangerously tight. Once in a while a cow will start to leak as the udder becomes tight. This is serious because milking becomes a continuous process. If a cow starts to leak we milk her dry, again treat the quarters and then seal the teats with collodion. By following this procedure we have cows dried off promptly and with very little udder trouble. The incidence of infected quarters at the next calving has been extremely low whenever we have followed this routine. The results have been so positive that I have come to believe that the treatment of all quarters during the drying off process should become standard procedure. It is the simple application of the time honored proverb, "it is easier to prevent trouble than to correct it."

The Milk Scales Hold The Key

At Harden Farms we would be lost without daily weights. Wide variations in daily milk weights spells out a poor milking job. They forecast disappointing production and predict trouble to come. Any sudden unexplained drop in the production of a cow forewarns of impending trouble and gives us a chance to stay ahead of it. Equally important and maybe the most important of all is that these daily milk weights serve as a challenge to the milkers because they realize that these weights are a positive and concrete evaluation of their work.

The milking practices you employ may be just as important as the bull you use.

The New "Silo Disease"

Corn and legume plants sometimes store up nitrates. The silage gives off a deadly gas. Know these precautions . . .

Condensed from Farm Journal

Ralph D. Wennblom

DROUTH, hot weather and high-nitrogen soils can team up to create a new health hazard for you and your livestock.

The threat comes from inhaling a new kind of poison gas given off by fermenting silage—nitrogen dioxide (different from the *carbon* dioxide gas in silos that we've known about for years.

Livestock sicken because the silage contains poisonous nitrates which get into the bloodstream.

Let's take the human side of it first. In 1954, a strange sickness began affecting silo-fillers in two or three drouth-ridden Missouri counties. There was one known death. However, few people outside of Missouri paid much attention to it—thought it was some freak local condition.

Then last fall, two Minnesota brothers, 28 and 31 years old, died mysteriously. Autopsies showed that they had inhaled nitrogen dioxide. When the doctors checked back, they discovered that about a month earlier, both brothers had tried to climb up the chute of a silo that had been filled with corn silage the day before. Choking fumes had driven them back down, coughing.

This sent Doctors Thomas Lowry and Leonard Schuman at the University of Minnesota Medical School looking for other cases. They now have proof that the gas killed one other farmer, and made three more seriously ill. No one knows how many may have been sickened. Some scientists believe that illnesses diagnosed as "pneumonia" in past years were actually nitrogen dioxide poisoning.

And the doctors suspect that small doses of the gas may cause "Farmer's Lung," which is fairly common among farmers but rare among city people.

Now it's true that three deaths may not seem like many, considering all the farmers who fill silos. But this year, if we have abnormal weather, there could be more. And what happened on some farms could happen on

Reprinted by permission from Farm Journal, Philadelphia, Pennsylvania

yours.

It behooves everybody to know about this new danger, and to take precautions that eliminate risk. Fortunately they are simple, and they are effective.

1. Watch for the gas while filling your silo. Nitrogen dioxide has an irritating odor and yellowish-brown color — you can actually see a heavy concentration. If your silo is dark inside, put in a light so you can see. Nitrogen dioxide is heavier than air and collects near the surface of the silage. Let the silage build up before you put in the doors.

2. Run the blower for 10 to 15 minutes before going into a partly-filled upright silo. And always keep the blower running while you're inside.

3. Do everything you can to insure good ventilation inside the silo and outside—especially if the silo adjoins the barn. The gas will funnel down, and any pocket where it can collect is a death trap.

4. Keep children and animals out of, and away from, the silo during filling.

5. After the silo is filled, don't go into it for 7 to 10 days. By that time the silage will have finished fermenting and all the gas will be given off.

The Minnesota report leaves little doubt that there is such a thing as "Silage Gas Poisoning." It cites the case of the two brothers and four other farmers with almost identical symptoms.

One Minnesota farmer was nearly overcome by fumes in his silo chute the day after filling. Three weeks later, he became seriously ill but recovered.

An Ohio farmer noticed irritating fumes about half-way up the chute of the silo that he had filled with "over-ripe" corn the day before. About a month later, he was hospitalized but recovered.

These silos were filled with straight corn silage. *Nothing was added during the filling—not even water.*

Another Minnesota farmer who spent a day inside a silo that was being filled with dry corn, *to which water was added,* became seriously ill.

Clover silage can also give off nitrogen dioxide gas. A Minnesota farmer who worked inside a silo that was being filled with

King Augeas had 3,000 oxen, but he didn't clean out the stables for 30 years. He had a tremendous problem in cleaning up that barn and, according to Greek mythology, turned the job over to Hercules. Hercules cleaned up the mess in one day by diverting the river Alpheus through the stables.

dry clover mixed with water, became short of breath that evening. He died at Mayo Clinic, Rochester, Minn., the following night. Doctors surmise that he inhaled a much larger dose of the gas. Massive doses are known to be fatal within 48 hours.

What causes silage to give off nitrogen dioxide? It's the inorganic nitrates in the plants, say scientists.

We've known that plants tend to store up nitrates under abnormal conditions, such as drouth. Immature or stunted plants usually run higher in nitrates, as *do* plants growing on soils heavily fertilized with nitrogen. *It makes no difference whether the nitrogen comes from legumes or fertilizer, say scientists.*

What we didn't realize is that these conditions apparently can result in silage which gives off enough nitrogen dioxide to kill you.

In the cases that the doctors studied, the corn and clover had been damaged by drouth. The farmer with the "over ripe" corn had "fertilized heavily" with nitrogen.

But another had put on only 300 pounds of 4-16-16 per acre. The two brothers who died used no nitrogen, but their corn was grown on a peat soil—high in nitrogen.

Last winter, scientists made samples of various silages to see how much nitrogen dioxide they gave off.

"Some gave off tremendous amounts, and others very little," says Rodney M. Briggs, University of Minnesota agronomist. *"In these tests, alfalfa silage also gave off the gas."*

The American farmer pays about 2 billion dollars a year for sheltering and feeding rats on his farm. The 200 million bushels of grain they destroy each year would make 12½ billion loaves of bread, or 317 loaves for each household in the U. S.

Minnesota researchers are trying to develop a warning device —treated paper which will change color when exposed to dangerous amounts of the gas.

Now, the livestock angle. High-nitrate forages can kill an animal. Missouri farmers who turned cattle into drouth-damaged cornfields in 1954 lost several thousand head. Animals grazing stunted, high-nitrate legumes also got sick.

Silage made from high-nitrate plants is usually safe to feed after it's been in the silo a few months. However, scientists know that animals don't do as well on silage containing excess nitrates, and suggest you supplement it with an energy feed such as molasses or corn.

Fight Frost with Sprinklers

Continuous sprinkling during freezing weather protects plants against damage from 20-degree temperatures . . .

Condensed from Electricity On The Farm

Donald R. Sisson

SPRINKLER irrigation is being used successfully to protect plants against frost damage during cold spells in late spring or early autumn. Crops have been protected satisfactorily when temperatures have dropped to 20° F. on still nights. Under windy conditions, this minimum temperature is slightly higher.

The plants are protected from freezing in this manner. When the air temperature drops below freezing, water sprayed on the plants starts to form into ice. When the water freezes, it gives off heat. Enough of this heat is absorbed by the plants to prevent them from freezing. As long as water is being applied continuously, the plant remains above its freezing point. For this reason, the irrigation system must be operated continuously during the period when the air temperature is below freezing and until all the ice has melted off the plants by above-freezing temperatures.

Utilize Irrigation Equipment

Most growers who have used sprinkler irrigation for frost control have adapted the same equipment that is used for dry weather irrigation. In practicing irrigation for frost control it is recommended that the grower be on the alert whenever the minimum temperature forecast is 40° F. or lower. The equipment should be set up in the field and given a "test run" before it is needed for frost control.

The irrigation system should be started when the temperature drops to 34° F. at plant level. Some sleepless nights might be avoided by the use of a temperature alarm placed in the field at plant level so that the operator may relax until time to start the system.

For frost protection it is necessary only that the wetted diameter from one sprinkler barely overlap the next sprinkler. A larger area may be covered by using a triangular pattern of springler settings and increasing the sprinkler operating pressure. Uniform application of water is not as criti-

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cal as for regular irrigation. Some growers plug one nozzle of a two-nozzle sprinkler to further reduce the water application rate. Michigan State experimentors report that an application rate of one tenth to one eighth inch per hour was adequate. Their studies include temperatures as low as 20° F.

Some problems may be created by repeated applications of water on successive nights. Water-logging of the soil and leaching of fertilizers, especially nitrogen, may result. Since a high rate of water application is not necessary to control frost, the water application rate can be reduced as compared to normal irrigation. This reduction helps alleviate the water-logging.

Continuous Operation Important

Trying frost control with irrigation for the first time, the irrigator is usually somewhat horrified and ready to give up when ice starts accumulating on the plants. He is pleasantly surprised the next morning when the air temperature has risen above freezing; the ice has all melted from the plants; and the crop has been saved.

Many strawberry growers in northern Indiana, Michigan, and other areas are finding that their sprinkler irrigation systems are almost as useful for frost control as for watering the crop. During the spring of 1954, eight to eleven consecutive nights of killing frosts were reported in these areas. Those that irrigated for frost control during these periods reported that irrigation was the difference between a good strawberry crop and a near failure--perhaps the difference between 400 or 100 crates an acre.

Saved Strawberry Crop

Jack Spreuer of Howe, Indiana, used his sprinkler control on one acre of strawberries during the spring of 1955. He reports that the net worth of the irrigation for frost control was $400 for this one acre. Spreuer used the same equipment that he uses to irrigate pasture for his dairy cow herd. He reduced his water application rate by spacing the sprinklers farther apart than for normal irrigation.

S. B. Scott of Franklin, Indiana, saved an acre of early set tomato plants when six consecutive nights of killing frost occurred during the first week of May, 1954. Many other growers have experienced as good or better results than Spreuer and Scott.

Michigan State University reports that tomatoes, peppers, peas and broccoli have all been protected from fall frosts in experimental work. Other crops on which frost protection by irrigation may be successful are cucumbers, beans, squash and cranberries. Frost protection need

not be limited to the spring months; it may be valuable also during early fall frosts.

Generally, tree fruits and tall slender plants such as corn, pole beans, gladiolus and hyacinths are not adapted to this method of frost control, because of the heavy ice load that builds up on the plant during low temperature frosts. Most growers report some success on these crops to temperatures as low as 27° F. but below that the ice load causes breakage of the plants.

A last word of advice to the grower practicing frost control—*Don't give up!* Be wary of frost on succeeding nights until the danger is past. The work of several nights may be lost if the irrigation system should fail on only one frosty night.

Prevention Best Cure For Hardware Disease

"Effective control of 'hardware disease' depends on keeping livestock and the hardware from getting together," says Ivan Watson, extension animal husbandman from New Mexico A & M College. "Livestockmen who are doing something about the problem, have given me several good recommendations. Here they are:"

1. Hold an annual clean-up of all scrap in or near livestock pens, grazing areas, barns, and feed lots. Loose baling wire, leftover fencing materials, cans, bottles, and scrap of all kinds should be picked up, concentrated in one spot, and then hauled to a public dump.

2. Make an immediate clean-up after fence building, fence repairing, roofing jobs, and other work where wire, nails, screws, fasteners, sheet iron or aluminum have been used.

3. Use greater care in control of baling wire. A continuous instruction and reminder program for all members of the family and hired men, showing how to handle wire from bales of hay will control losses.

4. Provide a centrally-located box, barrel or old oil drum into which all scrap, wire, cans and bottles are to be placed. Then make it everybody's duty to bring in dangerous material from all parts of the farm and deposit in the special container.

—*New Mexico News*

How to Get Started in Farming

A young farmer discusses partnership agreements.

Condensed from Missouri Ruralist

Gene Wills,
Recipient of American Farmer Degree in 1955

TOO MANY BOYS are leaving the farm. Why?

Most farm boys today are going to the city to find work. Very few are staying on the farm and getting established in farming. If boys continue leaving at present rate, in a few years we will not have enough farmers to produce sufficient food for the United States. This could result in a very serious problem.

Today and in the future a person will have to be well-educated in management if he is to succeed in the business of farming. Boys now leaving farms will not have this education, and if in later life they decide to return to the farm as a means of livelihood they will have a difficult time.

This question often is asked: "Why are boys leaving farms?" The answer is simple—it is difficult for today's farmer to make receipts exceed expenses.

Need Lots of Machines

The average farmer of today needs an enormous amount of machinery, equipment and supplies and capital investment. It is difficult for a young man to get enough money to make these purchases. This stresses importance of a partnership agreement. This can give a boy a feeling of security and also help him become more successfully established in farming.

A partnership agreement is not difficult to work out. The important thing is for all parties concerned to be as satisfied with the agreement as possible. A partnership is important in helping a boy get established as a lifetime farmer. Most farmers today started out with a partnership agreement with father, brother, uncle or a landlord.

There are many ways for working out such an agreement. The arrangement can be a 50-50

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partnership between a boy and his father, or a boy and another person.

Another plan could be a 25-25-50 agreement on rented land among a boy, his father and a landlord. These are two of many possible arrangements.

It is important that a partnership agreement be in writing. Before it is written, all facts and details should be studied thoroughly so all parties concerned have the same understanding. The agreement should be signed by all parties involved, and then stamped by a notary public.

Some people feel a partnership agreement between a father and son should not be in writing. The argument is that a written agreement would require the two to file separate income tax forms. Another argument is that a written agreement shows distrust between two persons.

In my opinion, neither of these arguments is sound. In the case of the income tax, it is not necessary for a boy and his father to file separate returns if the boy is under 21 years old and they both live in the same household. However, when the boy marries and moves to a different house, father and son must file separate returns.

It is my feeling written agreements between father and son do not indicate any distrust of one another. They serve, rather, to give a boy training in sound business practices which will serve him in later life.

There is another reason written partnership agreements are necessary. They usually seem complicated to people who did not help work them out. If one of the persons concerned should die, and the terms weren't in writing, it might be difficult to explain to relatives. This could result in misunderstanding and perhaps a break in family relationship. However, if the agreement was in writing any outsider should be able to understand all terms.

New Zealand claims a world record performance in topdressing land from the air. Beginning at 5 a.m. and continuing till dark, a pilot made three hundred trips, distributing fully 15 cwt. each time —a total of 230 tons.

Partnership agreements work. My farming program is based on three such plans.

My main agreement is with my father and concerns operation of the home farm. My dad and I have a 50-50 partnership. We are on a 50-50 basis on livestock, crops, machinery and some less-expensive buildings such as machine sheds and farrowing houses. Also, we share equally on all expenses, from the smallest electricity bill to feed and gasoline

bills. Receipts are divided on a 50-50 basis except on dairy cows and poultry flock.

My dad owns the farm. My rent is figured on the basis that I provide half the feed and half the expense on chickens and dairy cows. This equals about the same amount as cash rent and saves the trouble of keeping grain in separate bins, and keeping livestock separate. It also eliminates trouble and confusion of keeping separate records.

My dad and I raise registered Hereford cattle and registered Duroc hogs, and a variety of small grain and forage crops.

Besides the home farm, we rent parts of three other farms for the purpose of growing small grains and forage crops. Dad and I have the same type of agreements on two of these farms with a 25-25-50 basis. Dad and I provide equipment and labor, and the landlord, the land. The landowner pays 50 per cent of the expenses and Dad and I each pay 25 per cent. The receipts are worked in the same manner.

These agreements refer to hay and corn only. Other small grains are planned in the same manner except they are on a 33-1/3—33-1/3—33-1/3 basis.

The third farm Dad and I rent on a one-third basis, with Dad and me providing machinery and the landlord, the land. We each pay one-third of the expense and receive one-third of the receipts. These agreements have been working efficiently for me for five years.

Partnerships On Increase

Partnership agreements are on the increase according to a check I made. In the FFA chapters in Southeast Missouri district more boys are going into this type of arrangement each year.

To me this proves such agreements are successful in helping young boys become established farmers.

Our complex American society today is possible because only one farm worker is needed to produce for himself and 18 other persons living in town; in 1940 he could produce for only 10 others, and in 1860 for only 3½ others.

If you decide to enter into such an agreement and have any difficulty working out details, go to your Vocational Agriculture instructor or your county Extension agent. They will be glad to help you work out your agreements and also will give you some helpful bulletins.

I am sure my success in farming can be attributed to my efficient partnership plans. I also am sure my agreements helped me to receive the high FFA degree of American Farmer.

Where Does Your Field Time Go?

Think more about your field operations and save hundreds of dollars . . .

Reprinted from Iowa Farm Science

Kenneth K. Barnes

CAN YOU increase your net profits by cutting costs of field operations? Can you do this without making additional investment?

While we haven't studied your farm, we have made studies that indicate you probably could by planning and organizing work to make really efficient use of field time.

So we can talk about this without beating about the bush, let's first determine three terms we'll use. They're terms we use in agricultural engineering and have specific meanings.

Theoretical field capacity is the rate at which your tractor and machine (plow, combine, cultivator, etc.) would do the job if there were no interruptions —no clogging, no breakdowns, no slowing and turning. This capacity might be in terms of acres per hour, tons per hour or bushels per hour.

Actual field capacity is the average rate at which the operation really moves. If, at the end of 10 hours of corn picking, you have 800 bushels in the crib, your actual rate is 80 bushels an hour. Had you measured the rate at which ears were falling into the wagon for 2 or 3 minutes while traveling down the row, the rate might have been 110 bushels per hour. Thus, 110 bushels per hour would have have been the theoretical field capacity.

Looking at this another way: Say you plan to drive from your farm to town at 55 miles per hour by the speedometer—your theoretical speed. Arriving in town, if you divided the total distance by the total time required, you'd probably find you'd averaged closer to 45 miles per hour. Even though you held to the theoretical rate of 55 on an open highway, you lost time in towns, at stop signs, etc., and the actual speed was 45.

Likewise with farm operations, if we divide the actual field ca-

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pacity by the theoretical field capacity and multiply by 100, we get what we call *field efficiency.* This is simply a measure of how closely we approach the theoretical field capacity. One hundred per cent would be perfect. But we can't be perfect. We must slow down or stop to turn at row ends, to change wagons, to make adjustments and minor repairs.

TABLE 1. Typical Ranges of Field Efficiencies Under Normal Operating Conditions

Field operations	Expected field efficiency (per cent)
Most tillage operations (plowing, disking, harvesting, cultivating, etc.)	75-90
Drill planting	70-85
Checkrow planting	50-65
Combining grain or picking corn	60-75
Mowing, raking, baling hay	75-90

How Close?

Table 1 shows the field efficiency you could expect to achieve under good conditions. These values vary with field shape and size, soil and crop conditions, topography, size and type of equipment, contour or straight rows and operator's skill. This shows what you might expect to achieve. But let's look at what can happen.

Last summer we studied a number of field operations. One was a straw baling job. The record is shown in table 2. Note that we studied the job over three different periods of activity.

We actually followed the man operating the baler around the field and jotted down everything he did and how long it took him. Then we added the time used for various activities. Field efficiency was 63½ per cent during the second period shown. This is lower than the 75-90 per cent that we might hope to attain for baling (table 1). But it's not nearly as low as the 36½ and 41½ per cent field efficiencies during the first and third periods.

The Causes . . .

Let's take a closer look at the time losses for the three periods —not only to see where they came from but also to see what might have been done about them. In period 1, more time was spent on repair and adjustment than was spent baling. Much of this repair and adjustment could have been done in slack seasons —during winter or early spring or perhaps on rainy days. From a management standpoint, these are times when labor wouldn't have been worth much for other activities.

Also there were a couple of hired men helping with the baling operation. When the baler broke down and there was time out for repairs, the time of the operator and the rest of the crew

TABLE 2. Results of Time Study of Straw Baling During Three Separate Periods of Observation

Activity (Time spent)	July 11-13, 1955 (First period of observation)		July 18-19, 1955 (Second period of observation)		July 21-22, 1955 (Third period of observation)	
	Observed time (minutes)	Ratio of time for activity to actual time baling	Observed time (minutes)	Ratio of time for activity to actual time baling	Observed time (minutes)	Ratio of time for activity to actual time baling
Actually baling	426	1.00	382	1.00	231	1.00
Repair and adjustment	488	1.15	38	0.10	16	0.07
Waiting for and changing wagons	50	0.17	48	0.13	71	0.31
Turning and running empty	38	0.09	40	0.10	44	0.19
Unclogging baler	47	0.10	30	0.08	23	0.10
Replacing spools of wire	55	0.13	38	0.10	75	0.32
Traveling to and from fields	60	0.14	25	0.07	76	0.33
Total working time	1164	2.78	601	1.58	536	2.32
Total amount baled (tons)	40.8		37.3		25.6	
Theoretical capacity (tons/hr.)	5.75		5.85		6.65	
Actual capacity (tons/hr.)	2.10		3.72		2.76	
Field efficiency (per cent)	*36.5*		*63.5*		*41.6*	

waiting for bales to haul or put in the barn was lost. With two men helping with the baling operation, during the period of July 11-13, each had to spend about 8 hours waiting for the baler to be repaired. If the pay rate was $1.50 an hour, there went $24 wasted in those three days.

Putting the baler in shape in times when there was no field work to do might have saved quite a bit of time and quite a bit of money. During the second and third periods (after the baler had been repaired), a relatively small amount of time was needed for field adjustment.

Time spent waiting for wagons and changing wagons may be unavoidable. But there can be great differences in the amount of time spent on this activity. In the third period, the proportion of time spent waiting for and changing wagons was about twice that for the other two periods. This is influenced by the number of wagons, size of crew and the distance the bales must be hauled in relation to the capacity of the baler. But it's still the sort of thing which you may be able to do something about.

In the third period the baler operator had speeded up, and the theoretical capacity was increased to 6.65 tons per hour. However, this increase wasn't reflected in actual capacity. Part of the time gained by speeding up was lost waiting for wagons.

Time spent turning and running empty also is unavoidable. But you can minimize it by attention to field layouts and travel patterns as the baler moves over the field. Time spent unclogging various parts of the baler was low. Proper adjustment and a skillful operator minimize this time loss. In the third period an excessive amount of time went for replacing spools of wire. This can be reduced by having extra wire conveniently located to the operation. Time spent traveling to and from fields is another unavoidable factor. But it, too, can be minimized by careful layout. Or, with long hauls, two trucks might work out better than three tractor-drawn wagons.

The biggest single time wasters,

TABLE 3. Field Efficiencies From Time Studies of Selected Farming Operations

	Observed field efficiency
	(per cent)
Baling straw	61
Blowing corn silage	68
Picker-shelling corn	60
Stationary shelling of corn	57
Second cultivation of corn, 4-row	84
Field chop hay	55
Field chop corn silage	58
Mow hay	79
Rake hay	86
Spray corn, 6-row	71
Windrow oats	82

however, were field repairs and adjustments — items that could most easily have been taken care of before going into the field.

This is what happened on the baling operation. We could tell similar stories of other jobs. We've found field efficiencies varying from 55 per cent for field chopping of hay to 86 per cent for raking hay (see table 3). For some operations such as cultivating, raking and windrowing, performance was about as good as could be expected. For other operations, such as straw and hay baling, field chopping hay and silage, and corn shelling, performance was pretty low.

What You Can Do . . .

One of the major problems in reaching and holding a high field efficiency is the flow of materials. In fertilizing and planting operations, it's the flow of materials to the field machine. In harvesting operations, it's the flow *away* from the machine.

You can't, for example, plant corn any faster than you can bring the corn and fertilizer to the planter and fill the hoppers. A little planning on the spotting of supplies of corn and fertilizer along field edges might make a big difference. We've seen how waiting for and changing wagons can cut down efficiency for baling. The same ideas hold true for field chopping or corn picking.

Think about your field operations during the coming season. Where will your time go? Aim for making every minute in the field count. The results can pay off in dollars and cents.

Hog Farmers Profits Depend On Two Factors

Two factors—the price received and the cost of production—govern whether or not a swine farmer will make a profit in the year ahead. Many farmers tend to overlook the cost of production, the factor over which they have almost complete control.

"The simplest way to cut cost of production is to shift to meat-type hogs," says Dick Hollandbeck of Purdue University. Meat-type hogs average eight or more pigs per litter in contrast to the average litter of slightly less than seven pigs. Thus the overhead cost of maintaining the breeding stock per pig raised can be reduced. There is also less feed required per 100 pounds of gain for meat-type swine than for lard-type animals, making meat-type pigs more efficient users of corn. —*Indiana Extension*

Treasure of the Darkness

About an intimate, personal discovery by the President of the American Farm Bureau Federation. Of special interest to farm families . . .

Condensed from Guideposts

Charles B. Shuman

WHAT does a man need to overcome a personal disaster?

Two years ago I became a member of the lonely fraternity of men who have lost their wives. I did not know what to do. Our four children were alone, too, and I decided to resign as President of the Illinois Agricultural Association and go home to them. But they wouldn't hear of it. They were old enough to take care of things, they assured me.

So I stayed on the job, but I could not remove the dull ache from my heart. I hurried to the children whenever I could, struggling to hold myself together for their sake, yet painfully lost without Ida, the woman who had been my loving companion for 21 years. I sensed, in time, that my only peace came after climactic moments when, torn with anguish, I begged God for strength, and I found myself turning more and more to Him.

One quiet Saturday night as I sat alone preparing the lesson for my Sunday School class, I turned to the verses referred to in a recent newspaper Bible lesson: *And I will give thee the treasures of darkness, and hidden riches of secret places, that thou mayest know that I, the Lord, which call thee by thy name, am the God of Israel.**

Certainly I was in darkness, but where were my treasures? I sank back in my chair and searched for them, and slowly they came to light: my children, my friends, my work, my faith, the faith Ida had solidified by the example of her own life.

Some friends tried to console me with assurances that God had taken Ida at that particular moment because He wanted her to be with Him, but I could not accept that. A loving God would not cause such pain. I believed that Ida died simply because medical science did not know how to save her.

Had medicine known how to treat rheumatic fever during Ida's childhood, she wouldn't

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have needed the later operation which resulted in her death. Today, the disease holds less dread for its young victims, and there are many other diseases which, once fatal, need no longer be feared.

Since God is the seat of all knowledge, scientists, I believe, have only to put themselves close to Him to absorb His knowledge. It was Ida's misfortune to live too early in the slowly growing friendship between men and their God, but I believe some day that friendship shall be fulfilled, and there will be no more darkness.

There have been many lonely nights for me. Men who have shared this experience will understand that. Yet I have discovered the treasures in my darkness, all of which have made me realize how strongly I believe in God, how desperately I need Him, and what tangible peace He can provide.

* *Isaiah 45:3*

Italy's 'Rational' Chickens

The days of the barnyard hen pecking away on the Italian farm, fluttering and cackling to safety with every passing vehicle, may be running out.

The "pollo razionale" or "rational chicken" has appeared on Italian poulterers' hooks, and the Italian Association for Avian Selection and Production (AISPA) predicts that the new fowl will conquer and supersede any ordinary cackler.

The "rational chicken" has been known for some time to American supermarket shoppers. He (or she) is, in short, a chicken whose life—from incubator to pot, or grill—has been shortened to 70 days by the use of limited exercise, synthetic foods (88 ounces for every two pounds of weight attained), forced rest by longer, artificial nights, and, possibly, music instead of honking car horns to keep him or her happy.

According to AISPA, one person should be able to breed and attend to 198,000 pounds of rational chicken per year. How many chickens that means is not stated.

Up to now the Italian breed of rather athletic chicken, made lean by a constant life of peril and self-reliance, has been considered especially tasty by gourmets. But the advocates of the new chicken say that is nonsense: A rational chicken, they say, possesses a rational taste.

From the Italian Scene

Report on the Forage Crops

If you are undecided about trying a new crop variety or practice, go and visit someone who has tried it . . .

Condensed from Guernsey Breeders' Journal

Lester H. Smith, Extension Agronomist, Purdue University

NEW FORAGE crop varieties and management practices make it possible for dairymen to feed their milking herd and young stock top quality forage 365 days a year. This is important, because a slump in milk production due to poor quality forage cuts the milk check and requires feeding more concentrates.

Let's look at some of the new forage crop varieties. We'll take legumes first and start off with alfalfa.

Wilt Resistence

When Dr. Fred R. Jones isolated the bacterial wilt organism, he stimulated the breeding and production of alfalfa. Out of Dr. Jones' discovery came Ranger and Buffalo alfalfa — varieties that put alfalfa back on a firm footing in dairy areas where wilt was a problem. And now we have Vernal, developed at the University of Wisconsin. Here is the best alfalfa on all counts for the dairy farmer in northern dairy regions.

It's better than Ranger from the standpoint of wilt resistance, competition with bromegrass, yield, as a pasture plant, resistance to leaf spot disease, and winter hardiness.

Narragansett and Atlantic are also good short-term alfalfas, but they lack the wilt resistance of Ranger, Buffalo, and Vernal. I hesitate to recommend that a dairyman grow a variety that doesn't have wilt resistance. It's something like disregarding the value of being vaccinated for smallpox. Probably you're safe, but then again maybe you aren't.

More dairymen can grow alfalfa if they'll spread enough lime to push the pH of their soil up to 6.8 or 7.0. By doing this they may release enough locked-up phosphorus to pay for the extra lime. And at the same time they'll make a perfect home

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for the alfalfa roots and the nitrogen-grabbing bacteria that thrive in the root warts. This nitrogen is free, too, with no taxes on it. A good field of alfalfa takes 25 to 50 dollars worth of nitrogen out of the air each year.

And don't shortchange the value of potash for alfalfa and other legumes either. A high level of potash enables legumes to stand competition from bluegrass. That's one reason stands of ladino and alfalfa are often short-lived.

Ladino Clover

Ladino clover is coming to the front in dairy regions where there's ample moisture, good snow cover, and not too much hot, dry weather. In such areas it's replacing red clover. In fact, red clover hinders ladino from spreading the first two years after seeding.

But ladino clover can get you into trouble if you aren't set up to pasture or else make silage from the first crop. It grows so lush that curing the first crop for hay is well nigh impossible. Some dairymen pasture ladino to delay it for hay until after July first. Pilgrim is a superior variety of ladino.

Perhaps you can't grow ladino or alfalfa because of too dry or too wet conditions. And so birdsfoot trefoil is a good bet.

Birdsfoot Trefoil

Birdsfoot trefoil is a permanent legume that'll help balance out your forage program. It's equal to alfalfa in feeding value, produces a high quality milk, and has never been a bloat problem.

Trefoil does best on well-limed, heavy soils. It needs phosphate and potash, as do other legumes. It'll exist on poor soil, but the yield will be small.

Charlie Reed, Addison County, Vermont, calls birdsfoot trefoil "strawberry shortcake" because his heifers lap it up like dessert during the long winter, barn-feeding period.

Charlie started a field of trefoil in 1941, and now he finds it all over his farm. It spreads from one field to another in manure. He's growing trefoil on land too poorly drained for alfalfa. It thrives in the bottom of a four-foot drainage ditch that's full of water and ice during the spring months.

Empire is a hardy variety of trefoil. Considerable European seed is also on the market. It does well where the winters are not too severe.

Viking is a New York variety and Mansfield a Vermont variety that show promise. But seed is not available in quantity of either of these yet. Both varieties are

better yielders than Empire, and they come back quicker after cutting or pasturing.

So much for the popular legumes. Now let's look at bromegrass — the grass that's really come along by leaps and bounds.

Bromegrass

Several years ago, M. O. Pence, veteran soils and crops specialist at Purdue University, said to me, "Where has bromegrass been all these years and why didn't we discover its great value before?" I believe it's true that we agronomists were a little slow in waking up to the values of brome. Really, it took the drouth years of the thirties to make us appreciate brome, especially in the Midwest.

Brome is a natural companion with ladino and alfalfa for hay, pasture and silage. Harry Durgin, Orleans County, Vermont, dairyman, grows a mixture of eight pounds of brome, seven pounds of alfalfa, and one pound of ladino. He's stopped seeding any timothy, red or alsike clover, and claims he gets a better stand, more yield, and better quality hay than before.

Brome is a heavy feeder of nitrogen. As legumes start to thin out a complete fertilizer must be used or the brome will drop fast in tonnage. Brome likes a sweet, rich soil. It's a high class forage plant, being one of the most palatable, even when mature.

Sudan

Sudan helps you beat the hot, dry periods during mid-summer when other pastures are slow. Piper is a great variety. It's low in prussic acid, quite disease resistant, leafy, and makes lots of milk when fed to good cows.

Some dairymen seed rye on a plowed and harrowed sod in the fall. Early in June they harrow up the rye and put in sudan grass for mid-summer pasture. They may seed down in the sudan or wait until fall and seed down in a rye. This practice is a good way to rot down old bluegrass sod and get lime and fertilizer mixed with the soil before making a ladino-brome-alfalfa seeding.

Corn Silage

Corn silage is not only great milking cow feed, but it prepares land for seeding. You can save up to 25 per cent on concentrates by feeding corn silage cut in the hard dough stage.

Now let's look at some of the new ways of handling these crops.

Grass Silage

It's surprising but there are still too many dairymen trying to outsmart the weather in this job of hay making. If you're

growing ladino clover you just can't be sure of good winter forage without grass silage or mow curing. Really you need both.

The hay that we grow is so valuable that we should handle it like eggs so as not to lose the leaves. Both grass silage and mow curing saves the leaves.

And another angle that needs watching is quality in grass silage. Sweet smelling, high quality grass silage gives us better tasting milk — so important to watch if the consumer is to use more dairy products. Quite often analysis shows too much moisture. This is bad for two reasons. The silage may have "that awful smell" and the cow has to strain out too much water to get the dry matter she needs.

There are some new ideas in grazing these forage plants, too.

Strip Grazing

Strip grazing is not new. As a boy, one of my chores each morning in the summer was to hitch a calf to a 20-foot long chain that had a ring on the end for dropping over the end of a crowbar. The calf would circle feed around the crowbar during the day, and the next morning I'd move the crowbar to some fresh grass.

Well, that's all strip grazing is, only the field is pastured in strips and the fence is moved over each morning. If the field is quite large, it's well to follow with a second fence so the grazed area will recover faster. Scattering the droppings helps if there are lots of cows on a small area.

Henry Ferguson used "Yankee ingenuity" in making a movable fence post for strip grazing. Here's what he did. He used old drinking bowls for a form in which he poured concrete. Then he set a 24-inch iron rod in the concrete. Then he made a pig's tail bend on the top of the rod over which he slipped a piece of rubber tubing for insulation. This pig's tail holds his electric fence wire. And so he has a fence post with a rounded concrete base that weighs about 15 pounds. It doesn't tip over and is easy to move.

Zero Pasturing

Zero pasturing is another practice that's getting lots of attention these days. With zero pasturing, the grass is cut and brought to the cows. Quite often it's fed from bunkers in a yard or else the cows are kept in the stanchion.

Zero pasturing gives large yields per acre because the management is almost perfect and little forage is wasted. And rubber-tired wagons make it possible to bring chopped forage from distant fields of other farms.

Here again there's nothing new

about zero grazing. For years, small dairy farmers in the New England states have mowed a foddering of millet each night for their cows when pastures were short.

To keep pastures coming all summer long, more and more farmers are turning to irrigation.

Irrigation

Dairymen who have water handy say it pays to irrigate the new superior varieties of forage crops. Alfred Kingsbury and Son, Guernsey breeders of Cavendish, Vermont, irrigate with electric power. Even though the Kingsbury's have a moist soil, they find that irrigation takes some of the gamble out of whether there'll be water enough to grow a second or third crop of ladino-brome.

Of course, lots of land is so wet it never needs irrigation, and here's a place for reed canary grass.

Reed Canary

Wet land is always a problem. But if you seed it to reed canary grass you'll have a grass that'll last indefinitely, and hold up the wheels of farm machinery. Canary grass forms a mat from its tremendous fibrous root system.

Canary grass isn't equal to brome in feeding value, but lots of farmers find it makes good pasture and silage before it heads out.

I hope one of these forage crop practices will help you get more production from your herd. There are too many cows in every breed that never produce up to their inherent capacity just because they never get enough good forage to eat.

Lime Important in Farming

Leaving lime out of the farming program is like leaving water out of the radiator of a car. Lime is as badly needed in the soil as water is in the radiator of a car. It has a vital purpose, and if left off, soon yields will start down. It is not only pasture land that needs lime, but row crops need it just as badly and will pay off in high yields when plenty of lime and fertilizer are combined with good management.

If you're undecided about trying a new crop variety or practice, go visit someone who has tried it. Dean Arthur L. Deering of the University of Maine hit the nail on the head when he said, "Farmers need to get far enough away from their own farms so that they can look back home and figure out the weak points."

Agribusiness Opportunities

A learned discussion of the farm problem. Private effort to improve balance can forestall trend toward more governmental measures . . .

Condensed from Chemurgic Digest
Dr. John H. Davis,
Director of Program in Agriculture and Business, Harvard University

AGRICULTURE has become agribusiness.

The concept of agriculture as a distinct phase of our economy was appropriate 150 years ago when the typical farm family not only raised crops and livestock but also produced its own draft animals, and other equipment, fertilizers, and other production items; processed its own food and fiber and retailed in the community most of the excess above family needs. Then virtually all operations relating to growing, processing, storing, and merchandising food and fiber were a function of the farm.

Gradually farming has changed from a subsistence to a commercial status in that now the progressive farm family consumes only a fraction of what it grows—the balance being sold to feed the 88 per cent of the population employed off the farm. This modern farmer is a specialist who largely confines his operations to growing crops and livestock. The functions of storing, processing, and distributing food and fiber have been transferred in large measure to off-the-farm business entities.

Complimenting this development has been the creation of still another array of specialized off-the-farm functions—the manufacture of farm supplies, including implements, tractors, trucks, tractor fuels, fertilizers, feed supplements and mixed feeds, insecticides, weed controllers plus a host of other items. Today, the combined off-farm functions are considerably larger in magnitude than is the total operation of all our farms.

The term agriculture now, as 150 years ago, still appropriately is used to denote operations taking place on the farm, which consist mostly of the production of crops and livestock. But it no longer includes the processing and distribution of farm products nor the production of manufactured farm supplies.

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To enable us to think more precisely in this field, I have suggested a new word to describe the interrelated functions of agriculture and business—the noun *agribusiness.* By definition, agribusiness means the sum total of all operations involved in the manufacture and distribution of farm supplies; production operations on the farms; and the storage, processing, and distribution of farm commodities and items made from them.

The significant point is this—during the past 150 years, the food and fiber segment of our economy has evolved from a status of self-sufficiency to one of intricate interdependency with great segments of our industrial economy.

It is important to keep in mind that modern agribusiness is the result of a combination of forces actively at work for a century and a half. It is the product of a complex of evolutionary forces more or less spontaneously at work without central guidance or direction. In fact, so spontaneous and gradual has been the development of agribusiness that students of agriculture and business largely have failed to recognize it or hardly sense its existence. Agribusiness has no center of control or direction. Instead, it consists of several million farm units and several thousand business units—each an independent entity, free to make its own decisions.

Business Shares Responsibility

Farm surpluses are likely to be with us for some time unless positive steps are taken to prevent them. Contrary to much current publicity, the dominant factor today creating farm surpluses is improved technology. Postwar adjustment and support price policy are secondary forces in this respect.

The land grant colleges and the Department of Agriculture have played a role in creating present surpluses by developing better plants and animals, better management practices, better farming methods, and the like. Business, also, has played an important part in this picture. Because business manufactures and sells to farmers more than half of all farm production items, business is a decisive factor in determining the volume of farm production, year by year.

By constantly improving the quality of farm supplies and stepping up selling methods, business annually is adding to the productive capacity of our farms. The problem is that this constant increase in the capacity of agriculture to produce food and fiber takes place with too little regard to the need of the country for more food and fiber.

On the marketing side of agribusiness, business firms handle

virtually the entire production of agriculture in terms of processing and distribution. Yet, in general, these firms do not feel the same responsibility for moving products and expanding markets at a fair price to the producer.

In brief, today agribusiness *exists* as an entity comprised of closely interrelated operations, but *functions* as an entity which is so segmented and disjointed that production, processing, and distribution decisions are made more or less independently and with inadequate regard as to the cumulative effect on the economy. In this hit or miss pattern of operation the farming aggregate tends to suffer the greatest repercussions from overproduction in that it is left holding the surpluses which the researchers and supply manufacturing phases of agribusiness have helped to create and for which the processing-distribution phase has provided no ready market.

In tests with swine at Iowa Agricultural Experiment Station, the use of automatic waterers resulted in 10 pounds additional weight over pigs watered twice daily.

However, in the long run this effect tends to be imputed to the business phases of agribusiness as evidenced by their tendency towards profits and wage rates. Further evidence is seen in the recent tendency for food and textile firms to diversify horizontally by expanding into unrelated fields.

Cost-Price Squeeze

The existence of surplus farm commodities tends to subject agriculture to a chronic cost-price squeeze which in turn tends to retard economic progress.

The cost-price squeeze is a complex problem, brought about by a number of factors, some originating within and others outside of farming. One factor is the tendency of farm production to expand faster than demand, except during periods of emergency needs such as wartime. Responsibility for this tendency must be shared jointly by farmers, research agencies and the manufacturers of farm supplies since all are helping to increase the capacity to produce food and fiber.

A second factor is the inability of farm management to tailor production to demand when the two get out of balance. This inability, in large measure, stems from the fact that farm production is a growth process in which the production schedule is tied to the seasons, and the yield per acre to the weather. Further complicating efforts by farmers to precisely relate supply to demand are the large numbers of

farm units and the high degree of substitutability of one commodity for another—particularly with respect to food.

A third factor is the relative inelasticity of demand for farm commodities. This means that a given surplus tends to have an amplified negative effect on price. Even though, basically, the cause is inherent in the nature of the demand for food and fiber, still processing and distributive agencies do have within their power the ability to influence to considerable extent the demand and price for such products. A final factor contributing to the cost-price squeeze of agriculture is the tendency of farm supply prices to change much more slowly than commodity prices. Thus, when the latter fall, the former become the floor against which the price-cost squeeze presses.

Because the cost-price squeeze is the result of so many factors, several of which originate off the farm, farmers acting alone have been unable to solve the problem by their own efforts. Actually, it is a problem of long standing, the seriousness of which has tended to intensify as farmers have expanded their use of purchased supplies and increased the relative percentage of total output offered for sale. The cost-price squeeze was behind the Granger Movement of the 1870's and the Populist and Free Silver Movement of the 1890's. Following World War I, it was reflected in a drive for cooperative marketing and the pressure for McNary-Haugen type legislation. As the great depression years approached, the mounting pressures culminated in passage of the Agricultural Marketing Act of 1929, which created the Farm Board, and the Agricultural Adjustment Acts of 1933 and 1938. Following World War II, the pressure for remedial legislation has continued unabated.

More Government?

By permitting the cost-price squeeze to continue unsolved we are accelerating the trend towards governmental measures to offset its effect.

The magnitude of the pressure in this direction is evidenced by the fact that currently government is assuming a larger and larger role. This trend is not likely to be reversed unless, and until, the private sectors of the economy comprising agribusiness, themselves, find a way of solving the problem without resort to government.

In large measure, it is the squeeze between excessive supply and limited markets that has generated the pressure for governmental price support programs and other forms of public aid to agriculture. In essence, policy makers have sought to counteract the depressive forces affect-

ing agriculture by governmental action rather than by coordinating and strengthening the operations of the private segments of agribusiness to enable them to do the job. But to date, governmental aid really has not solved the problem because the production side of agribusiness still continues to expand output faster than the marketing side can develop outlets at prices compatible with general economic conditions.

"If you could kick the person responsible for most of your troubles you wouldn't be able to sit down for the next six months."

More Private Effort

The private sectors of our economy must develop new strength within themselves for combatting the cost-price squeeze if we are to reverse the trend toward government aid to agriculture.

A first step towards this objective is the reappraisal of food and fiber policy on the basis of agribusiness comprehensiveness.

The essential thing is to examine the issue in its comprehensive setting. In a dynamic economy, policy formulation must be a continuous process—such being the basis of progress. Actually, policy making will be taking place simultaneously at the commodity level and at the national level. In the case of a commodity the problem must be examined with respect to production, and with respect to the policies of other commodities, the national responsibilities. Once this process is in motion, national policy making will consist of coordinating the numerous commodity and regional policies and relating these to national objectives.

At best this will be a gradual process. During this interim, we will have little choice but to utilize government programs as a means of obtaining time in which to evolve better answers.

Piecemeal Research

One of the first essentials is to organize research on an agribusiness basis. We must have facts in order to make valid decisions. Heretofore, agricultural research has been conducted largely on a piecemeal basis, the various phases of a problem being studied more or less independently. But we can never expect to find answers in this way to the complex problems which exist today. We must organize our research on a base that is as broad as the problems we want to solve. For example, when analyzing the problem of what level of farm income is desirable, we cannot expect to find answers by studying farm prices, farm costs, or socalled middlemen's margins as separate factors. Not

only must they be examined as related factors, but they must be viewed in the total setting of the agribusiness economy and against the background of our national economic goals.

I am not suggesting that we drop the research we are now doing. Rather, I am pleading that we reorient it on an agribusiness basis and then, if necessary, add new projects to fill in the gaps which become apparent as we look at the broader picture with proper perspective.

After we have organized research on an agribusiness basis, we must start policy discussions on an agribusiness basis. In this, the leadership of established organizations—both producer and business—can play an important role. Research technicians should be called in to provide essential information and to get instruction as to what additional research is needed.

The editor of the Arcadia, Wis., News-Leader ventures "that the action of some children suggests that their parents embarked on the sea of matrimony without a paddle."

In general the industrial sectors of the economy have achieved greater economic stability than agriculture by means of vertical integration — integration which relates the procurement of raw materials, production, and distribution. This has been achieved by numerous methods, including central ownership, franchises, and other contractual arrangements.

Means to Stability

In essence, the job confronting agribusiness today is that of finding techniques and devices which will provide economic stability comparable to that which industry has achieved through vertical integration. The weakest link in the agribusiness structure, of course, is the one between production on the farm and the processing and distributing functions which are performed by business.

To assure economic progress and to strengthen our national economy we must find ways and means of building new strength into agribusiness so that gradually it can assume more and more of the stabilizing functions now performed by the federal government.

Our real objective must be to evolve new and better courses of action, in the light of what is good for agriculture, good for business, and good for the public.

The basic solution of so-called farm problems is balanced progress—progress which can bring with it unprecedented opportunity for both the farming and business phases of agribusiness.

The old idea of trying to solve

the farm problem on the farm is outmoded.

Today we are on the threshold of a new era—the atomic era—the potential of which no man knows. One thing, however, is certain: great opportunity lies ahead of us. Even now promising research is going on to develop techniques such as the tenderizing of tough meats and the preservation of food through irradiation. These, and scores of other techniques not yet thought of, are certain to be perfected in the decades ahead.

One of the great blessings which accompanies a dynamic, progressive economy is that it contains within itself the power to overcome maladjustment and past mistakes. This is true because it constantly is creating new capital, new jobs, and new business opportunities. In such a climate the weaknesses of any one phase of the economy can be corrected without loss to other phases. On this score America is particularly fortunate among the nations of the world.

In the dynamic era ahead the term "farm problem" will become more and more a misnomer; farm problems will be recognized as being also business problems and vice versa. More precisely, farm problems will be agribusiness problems. Therefore, we must solve them through the agribusiness approach. By this approach we should be able to improve the economic status of agriculture, reduce the role of government on the farm front, enhance the profit opportunities of business, and assure the consumer of high-quality food at reasonable prices and with less drudgery of preparation.

Milker Air Leaks Cause Bad Taste

Beware of air leaks in pipeline milkers. They can cause a bad taste in milk. Two Michigan State University researchers found in their study of pipeline milkers that leaky valves cause acid to form in milk, giving it a bad taste.

They also found that extremely long pipelines with many risers caused churning and rancid milk. The researchers concluded that stanchion lines in large barns could be made to produce excellent quality milk by stopping air leaks, reducing the height of risers and the length and slope of the line.

When lines are too long a valve can be installed at the midpoint of the continuous pipe so the milk will be drawn from only the midpoint to the milk room. *—Michigan Extension*

Foot Rot of Cattle

Late report on Pododermatitis . . .

Condensed from Wisconsin Circular 423
Department of Veterinary Medicine,
University of Wisconsin

FOOT ROT is an inflammation of the tissues of the feet. If not checked, it often leads to pus tracts, death of foot tissue, and in extreme cases to the loss of one or both claws.

Causes . . .

Bruises, cuts or punctures of the feet, if discovered and attended to promptly, heal without further damage. When harmful bacteria get into the wounds they may cause serious complications.

These bacteria may be of several kinds. One common offender in cattle is Spherophorus necrophorus. This soil organism frequently causes similar conditions to other animals also.

Clinical Variations . . .

At lease five variations of foot rot are often seen:

1. A swollen, hot and painful foot with no visible break in the skin.

2. Swelling of the tissue between the claws associated with an open wound. This is the most common type in cattle, with the exception of animals recently shipped.

3. Swelling of the ball of the foot (digital cushion). This often occurs in wet weather when the water-softened cushion is bruised by rocks or other hard objects resulting in an open wound.

4. Infected cuts caused by wire or sharp objects.

5. Injury and sloughing above the hoof, frequently seen in cattle soon after shipment when animals step on each other. Lesions develop in the soft tissues usually above the hoof proper. More dead tissue may be involved than in any other type. Wounds up to 3 inches in length are not uncommon.

Importance . . .

Foot rot seldom causes death. However, loss of milk production, flesh and market value is often great, especially when proper early treatment is not given.

Prevention . . .

Prompt treatment can prevent most cases of foot rot from becoming serious. Cases resulting from shipping are an exception. A good preventative measure is daily careful observation of the herd. Vigilance is invariably the

Reprinted from Circular 423, University of Wisconsin Extension Service
Madison, Wisconsin

most economical safeguard.

Some dairymen regularly observe every cow carefully as she comes into the barn. Lameness, shortening of the stride, even a slight swelling above the hoof, and hesitancy in stepping across the gutter are all danger signals that should be heeded.

Irregularities in gait may be due to the fact that the feet need trimming, a practice that should not be neglected. Often a careful inspection will reveal minor wounds that can be easily handled at the time.

Clean dry barnyards are always desirable. Stones, sticks of wood and other debris should be removed and good drainage provided.

Treatment . . .

No specific treatment will fit all cases. If the lesion is not extensive, carefully removing the dead or necrotic tissue, applying a disinfectant solution and bandaging the foot for a time may be all that is necessary.

If the condition is of long standing and much tissue is involved, a major operation by a veterinarian is usually required. Structures inside the foot are delicate and easily injured. Promiscuous cutting may be very dangerous and, without anesthesia, very painful to the animal.

In some cases, veterinarians inject drugs into the blood stream to cure foot rot. Cases where damage is deep and extreme do not yield to this treatment.

Sometimes amputation of one claw may be necessary to save the animal's life. Reliance on the advice of your veterinarian is recommended since he sees many cases every year and can usually, by proper treatment, surgery, or both, effect a cure.

Permanent and Rotation Pastures Differ Little

The USDA says there was no clear-cut superiority of permanent pastures over crop-and-pasture rotations, or vice versa, in dairy-cattle grazing studies.

Orchard grass and Ladino clover, in a five-year rotation with corn and wheat, outyielded permanent pastures of Kentucky bluegrass and white clover under below-normal rainfall conditions in the third, fourth, and fifth years of the test.

But in the full five-year test, the rotation pastures yielded only 5.3 per cent more dry matter and 5.8 per cent more TDN (total digestible nutrients) than the permanent pastures. Labor requirements for producing were low, and were about the same for both methods. —*Kentucky Extension*

CHAMPIONS OF FARM SAFETY

F. F. A. Boys seek out and remove hazards

Condensed from Ohio Farmer

Glenn F. Schotten

AN ASHTABULA County, Ohio, farm boy started up the tractor in the shed as rain beat a rat-a-tat on the roof. The rumble filled the garage and above the exhaust, carbon made a black spot on the low ceiling.

"Hey, haven't you got a spark arrestor on that exhaust?" someone shouted above the din. It was Future Farmer Eddie Sigmund, a livewire in the Grand Valley, Ohio, Chapter that won first place in the state community improvement project in farm safety. He was only ribbing Jim Goshorn, his friend on the tractor. But Jim knew he was right.

It's this kind of eagle-eye consciousness of hazards around the farm that's made the Grand Valley boys safety champions. And, unselfishly, they've tried to get across this same alertness to potential danger to their neighbors.

Not so long ago a cow fell in an open well in a pasture. Covering the well after the accident was like locking the barn after the horse was stolen. But, better late than never. And it could have been a baby, rather than a cow. This well got a red tag, bearing skull and crossbones, fastened onto it by the boys.

Other open wells that had never been the scene of tragedy were marked, too, reminding the owner that a cover was in order.

The 32 boys in the chapter roamed over farms in four townships. After visiting over 80 per cent of the farms, they tallied almost 8000 hazards in barns, other outbuildings and nearby land.

The boys sold reflecting tape to stick to the rear end of tractor-pulled machinery like combines, manure spreaders and balers. When auto lights strike these red strips, they shine like tail lights, giving the motorist an inkling of danger ahead. Pulled machinery usually hides the rear lights of the tractor, so this tape can be a real lifesaver.

Farmers and city folks as well have patted the boys on the back for the job they did on the 37 bridges in the neighborhood. In most cases these spans are narrower than the dirt road, making driving at night ticklish business, especially for strangers.

The schoolboys pasted foot-

Reprinted by permission from Ohio Farmer, Cleveland, Ohio

long strips of reflecting tape at the four corners of the bridges, telling the motorist well in advance that he'll have to slow down and curve in.

When these safety salesmen arrived at the farm, either alone of with a buddy, they told the owner about the project and requested permission to look over the premises.

Eddie Sigmund was the big sparkplug of the drive for safer farming. He went outside his own neighborhood and inspected

If we can't love our enemies, we can at least treat our friends a little kindlier.

64 of the 299 farms visited. "He can spot danger a mile away," Grand Valley Agriculture Teacher Leo Wene says.

What are some of the glaring hazards that farmers put up with on their places? Electrical trouble spots, especially faulty wiring that might mean potential fires, were common. In one barn the metal cable had rusted through, exposing the live wires. After a visit by the boys, the cable was replaced with new, safe plastic wires.

Electric light bulbs in the barn were often bigger than they should be for safety. When these high-watt bulbs are used, especially unprotected, they collect dust which may catch fire from the heat. A 60-watt bulb is usually safe.

Many electrical appliances such as water coolers, were poorly grounded. Loose boards with nails sticking up were a hazard for some barefoot boy or girl—or an unsuspecting farmer.

The hay mow was a goldmine of risk, the boys discovered. Gaping holes for someone to slip through were common. The young farmers fastened red tags over these, in hopes the farmer would put on a cover. One barn had such loose mow flooring that one more step might mean a plunge down onto the cows' backs.

Gasoline and kerosene were often stored in tight buildings, letting the fumes build up to dangerous portions.

Not everything is rosy after the campaign, of course. Just because a high school lad hangs a red danger flag on a broken ladder or rickety steps doesn't mean the owner will run right out and fix it. A fourth of the hazards found were remedied.

Although this may not seem a high figure, it doesn't take into account the change in thinking of the farmer. The process may be fast, it may be slow. Whichever it is, this greater safety consciousness is the unseen reward for these 32 farm boys, who themselves are getting a hard-to-beat lesson in "playing safe."

Grub Control in Cattle

New chemical feeding treatment proves successful in controlling cattle grubs on experimental basis . . .

Condensed from
Western Livestock Journal

IT recently was demonstrated experimentally that the common cattle grub (Hypoderma Lineatum) can be prevented from developing within cattle. This feat, long a goal of agricultural science, was accomplished by feeding an organic phosphate chemical — 0,0-dimethyl-0-2,4,5-trichlorophenyl phosphorothicate—to grub infested animals. Announcement of the success came from the U.S.D.A.

The chemical, designated for experimental purposes as Dow ET-57, is systematic. It moves through the bodies of cattle to destroy grubs wherever they may occur in the flesh.

These first highly promising experimental results are considered a milestone in research progress toward development of a systematic grub-control chemical that can be used by livestockmen. Research is currently in progress to determine the suitability of ET-57 in terms of grub control, toxic effects on the animals, and chemical residues in milk or flesh.

Cattle grubs cost the livestock industry an estimated $100 million a year in losses of meat, milk and damaged hides.

A recent survey showed that 38% of the cattle received at several midwestern packing plants were grub-infested, and that because of this infestation, packers trimmed away loins and ribs—on the average, an extra $8 worth of meat.

Average cost of electricity to farmers has gone down nearly 50 cents per 100 kilowatt hours since 1947-52, while the average monthly electric bill paid by farmers has gone up more than $3 in the same period.

The pest is controlled at present by use of the insecticide rotenone to treat the grub after it makes an emergence hole through the hide on the back of an animal. This type of control as-

Reprinted by permission from Western Livestock Journal, Los Angeles, Calif.

sures some protection against future infestation.

When the grub emerges from the animal's back it drops to the ground and pupates. Heel flies emerge from the pupae. These attach their eggs to the hair on cattle, greatly disturbing the animals. The eggs hatch into tiny grubs that enter through the skin into the flesh of the animal; thus start the cycle again.

It costs about $200 today to raise a Holstein heifer from birth to first calving in feed, bedding, labor, housing and other items.

ET-57 is not the first systematic chemical to control cattle grubs, but it is the first to prevent grub emergence. During the past few years, entomologists of USDA's Agricultural Research Service have marked up successes against cattle grubs by feeding or injecting cattle with such insecticides as aldrin, dieldrin, lindane, Bayer L 13/59 and diazinon.

Grubs in cattle treated with these chemicals generally emerged from the backs of the animals but failed to survive pupation. In this way, these experimental materials were as effective as rotenone, which is rubbed into or sprayed on the backs of cattle as grubs emerge.

Food Industry Adds Jobs; Farmer's Share Declines

Population increases and growing demand for conveniences in food packaging and processing have added nearly one-half million new jobs in the nation's food marketing industry since 1950, reports Elvera Horrell, Oregon State College economist.

The trend of built-in food conveniences is causing a wide gap between prices farmers receive and the food price tag at the corner grocery, the economist says. In 1955, farmers received only 41 cents of each dollar spent for his produce—the other 59 cents going for rising costs of getting food from the farm to the family table.

About 400,000 more people were working in the marketing of farm-produced foods last year than in 1950. And each food processing and marketing employee's earnings averaged about 28 per cent more per hour than in 1950.

Retail prices for domestic farm produced food now averages 20 per cent more than in 1950. Homemakers can trim the grocery bill by using time and energy for more home-processing of food, says Mrs. Horrell, or time and energy can be saved by paying for the services. *—Oregon State College*

Now We Put Our Fruits to Sleep

Modern on-farm cold storage methods with carbon dioxide help to lengthen the marketing cycle and offer great possibilities. Here's how to do it . . .

Condensed from New Jersey Farm and Garden

Dr. R. M. Smock, Cornell University

IT IS NOT commonly realized that fruits are living things even after they are picked. Like humans, fruits breathe in oxygen and give off carbon dioxide.

There are a number of ways in which the respiration rate (living rate) of fruits can be influenced. One of these is temperature. The lower the temperature, the more slowly will fruits respire or ripen. This is the basic principle of cold storage.

Another factor which affects rate of respiration is the oxygen level. Normal air is 21% oxygen. If the oxygen level is reduced the fruits respire or ripen more slowly.

A third factor is the carbon dioxide level in the atmosphere. In normal air there is about .03% carbon dioxide. If the carbon dioxide level is allowed to build up around fruits they respire or ripen more slowly.

A combination of all three of these principles (low temperature, low oxygen, high carbon dioxide) is used in controlled atmosphere storage.

How Does It Work?

First, the operator must have a gastight room. If the room is not perfectly gastight it cannot be operated as a controlled atmosphere room. Rooms are usually made gastight by lining the room with sheets of galvanized iron with sealed joints. The gastightness of the room can be tested by putting a little air pressure on the room and seeing if it will hold a small amount of pressure for a period of 20 minutes. The room is filled with fruit. If it is not filled, the proper atmospheres cannot be maintained. The room is refrigerated as in ordinary cold storage to get the proper temperature. After the room is filled, the metal gastight door is sealed on.

The first day after sealing, the operator starts analyzing the atmosphere in the room for both carbon and oxygen. The proper combination of gases and proper

Condensed from New Jersey Farm and Garden,
Sea Isle City, New Jersey

temperature depends upon the variety being stored. With McIntosh, for example, it would be 5% carbon dioxide and 3% oxygen at 38 degrees F. When the operator finds upon analysis that the carbon dioxide level exceeds 5%, he starts up the "scrubber."

This equipment involves air-washing equipment, utilizing a weak solution of caustic soda or lye. The washing equipment is operated until the carbon dioxide level is back down to the proper level. When the operator finds that the oxygen level is below 3%, he merely adds a little bit of outside air to the room to replenish the oxygen.

What Good Is It?

The main purpose of controlled atmosphere storage is to lengthen the storage life of apples. For example, McIntosh normally have to be sold out of ordinary cold storage by February. In controlled atmosphere storage McIntosh can be kept until May or June. This lengthens the normal marketing period and gives the consumer good apples from September until early summer. It means the grower doesn't have to sell so many apples in the fall and early winter.

Controlled atmosphere apples hold up on the market place very well. Here we have what is known as a "residual effect" of storage. Of course, these apples come out of storage in a firm, crisp condition but they actually keep in a hot store longer than we would normally expect. It is almost as though the fruits had been anesthetized and didn't quite recover. For this reason, they are sometimes called "sleeping apples."

There is no problem of rats or mice in such a storage.

On some varieties such as Rome Beauty the scald hazard is actually reduced as compared to storage in regular cold storage. Low temperature troubles such as soft scald and brown core can be avoided.

What's Bad About It?

Storage is always a speculative risk. Long-time storage is even a greater risk. There is no guarantee that apples sold in the spring will bring a high price.

It is a more expensive type of storage than regular storage. It is estimated that it costs 30-35 cents per box per season to store apples in this way in your own storage. If you rent space in such a room the normal charge is 60-65 cents per box per season.

There is a lot of "monkey-business." Gas analyses must be made both night and morning on each room. This means extra labor. Furthermore, not every farm laborer can learn to do a gas analysis. The grower can't go to Florida for a month unless he has very capable help at the farm.

One can't open up the room and take out half the contents for marketing and seal it up again. Once he opens it up he must start marketing the fruit during the next two months.

One can't go freely into the room as he would with a regular cold storage room. If he does go into the room to replace a fan belt or a burnt-out motor he must wear an oxygen mask. He would suffocate if he didn't do this.

Did you know that Social Security provides a lump-sum payment from $90 to $225, when an insured wage earner dies? This benefit is paid to the surviving spouse or to the person paying the burial expense. But this payment can be made only if an application for it is filed within two years after the date of the wage earner's death.

If good care isn't taken of the fruit, it may all be ruined. If the oxygen level is allowed to stay too low for too long a time the fruit would all die for lack of oxygen. Such fruit is worthless.

The scald hazard is even greater than in regular cold storage on some varieties such as Cortland.

This newer type of storage was developed by two English scientists, Franklin Kidd and Cecil West. It was introduced into this country by Frank Allen about 1934 in California. It's biggest commercial development in this country has been in New York and New England. It started out slowly back about 1940 in New York with just McIntosh. Some of the early operators abandoned the procedure because they had leaky rooms. The first really successful venture in New York was in 1943.

At the present time about 800,000 boxes of apples are stored in this way in New York and New England. There are 55 such storage rooms in New York and about 15 in New England. Several new operations are being constructed in Virginia this year. There are three such storages in Quebec, three in Ontario, and several in Nova Scotia.

What of Future?

The question is constantly being asked—where is the saturation point? Up to this year controlled atmosphere storage has been a profitable business. Sooner or later it is inevitable that there will be so many of these good apples for sale that the premium paid for them will disappear. What the saturation point is, nobody knows, and we won't know until that point is reached.

However, even when the premium disappears, this type of storage is here to stay. We are

increasingly storing varieties other than McIntosh. Delicious, Golden Delicious, and Rome Beauty apples are now being stored this new way. In the future, still other varieties like Stayman may be stored in CA storage. New markets are constantly being found for these high quality apples in the spring. For years, New York and Boston were almost the sole outlets for these specially stored apples. At the present time, they are being shipped all through the Middle West and deep South.

Another reason it is here to stay is that having one or two million boxes of apples "off the market" until April will lighten the marketing load on apples stored in regular cold storage.

Promises for Vegetables

Controlled atmosphere storage works marvels with pears. For example, Bartlett pears can now be kept until February. There are no commercial installation for pears, however. It is quite possible that the great success film box liners have had with pears will mean that CA storage will have no commercial place with this fruit. Peaches can be kept slightly longer in CA storage but not enough to justify the expense. There are some flavor losses in peaches in CA storage.

Comparatively little research has been done on vegetables but more is in progress now. Low oxygen storage shows promise with certain vegetables, but no commercial development has yet been made.

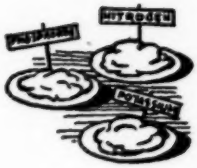
Artificial Breeding of Swine

Artificial insemination in swine is a possibility, but more research is needed before it can come into wide-scale commercial use, accordng to R. H. Grummer, animal husbandman at the University of Wisconsin.

"The technique is being used commercially in one area of Wisconsin now, but is still an infant taking it's first steps," he points out. There are several stubborn research problems to overcome which might be conquered in short order or they might remain unsolved for a long time.

Artificial insemination will probably never make the boar as obsolete on the average farm as it has the dairy bull, Grummer says. It should have wide-spread use in areas where the swine enterprise is small—one to six sows. *Wisconsin Extension*

Making Money with Fertilizer



Farmers are using only half the fertilizer recommended by experiment stations . . .

Condnsed from Southern Planter

Dr. Malcolm H. McVickar

FERTILIZER is a "double-barrel" money maker! Its judicious use produces more crops of better quality. What's more, the wise use of fertilizer helps the farmer produce each unit cheaper.

This happens regardless of the commodity, be it corn, wheat, hay, beef, milk, vegetables, or fruit. Then, on top of all this, conservation comes as an extra dividend. One thing is certain, and that is that big crops come only from productive fields.

In this day and age of high cost of labor and other fixed charges, it costs just about as much to plant and harvest a puny crop as a high-yielding one. Here are the records of two corn fields located side by side. The harvest on one field was 48 bushels per acre. The other field produced 106 bushels per acre.

What made the difference? A large part of it was the use of fertilizer, although other good farming practices helped to contribute to the higher yield. A breakdown of production costs shows that fixed costs, consisting of soil preparation, planting and cultivating, were identical—$31.66 for each field. However, other costs varied.

On the high-yielding field, the fertilizer expense rose from $4.25 to $34.74 for the 106-bushel field. Then, there were higher costs for seeding and for picking. And, of course, more interest on the investment.

All in all, the cost for producing 48 bushels of corn per acre amounted to $42.48; for 106 bushels per acre, $76.24.

But what about the pay off? It's not the total production cost that counts—it's the unit cost of production. Here is what actually happened. The production cost on the low-yielding field was 88 cents per bushel, but on the high-producing field, the cost dropped to 72 cents per bushel —a difference of 16 cents per bushel in favor of the high-yielding field.

If you figure corn at $1.50 per bushel, the profit from the 48-bushel field amounted to

Reprinted by permission from The Southern Planter, Richmond, Virginia

$29.50 an acre, while the 106-bushel field netted a handsome profit of $82.76. The figures speak for themselves. Only one conclusion can be drawn. It's this: "You can't afford *not* to use enough fertilizer!"

No doubt if chemical analysis had been run on the corn, the results would have shown that the corn produced with good fertilization was higher in protein and other feed constituents than the corn from the low-yielding field.

Fertilizer Improves Quality

A good example of how the the wise use of fertilizer leads to the production of more nutritious feed is well illustrated by an experiment conducted by the Virginia Agricultural Experiment Station at Glade Spring, in Southwest Virginia. The experiment shows how fertilizer favors the production of the more nutritious plants in a grassland agriculture.

For this experiment, a field was selected which contained approximately 75 per cent broomsedge. One portion was fertilized with the equivalent of 600 pounds of 8-8-8 fertilizer per acre. Another section received no treatment and was left as a check plot. Annual treatments were begun and lasted over a period of five years.

In the spring of the sixth year, counts showed that bluegrass and white clover had almost completely crowded out the broomsedge on the fertilized area, leaving only 8 per cent of the treated area still covered with broomsedge. On the untreated section, however, no decrease in the broomsedge had taken place.

A new concept in soil fertility is sweeping the country. It's sound—sound as a dollar, for it's based on scientific experiments and backed by leading farmers everywhere. The new concept can be stated simply. "You can produce high yields from your land and at the same time conserve your soil." In fact, the higher the yield, the better the conservation.

Sounds like magic? No, not at all! It's merely the rather sudden recognition in farming science circles that there can be such a thing as producing big crops and building soil organic matter at the same time—that is, if you proceed carefully and act wisely in accordance with the best management practices. It's another reason for striving for high production.

Corn Can Improve Land

Take corn, for instance, which has a general reputation of being a soil destroyer. This crop properly grown can be made a soil saver. Dr. A. W. Klemme of the University of Missouri makes this comment:

"There is much experimental

evidence which shows that high yields of corn, 100 bushels or more per acre, will return more residues to the soil than a legume crop turned back. For example, in our studies, a 120-bushel corn crop left 8,800 pounds of tops and leaves on the land. An 80-bushel corn crop left 5,600 pounds, and a 40-bushel corn crop about 4,000 pounds. It would take a full year's growth of sweet clover in its second year to equal the 8,800 pounds of organic residues put into the soil by a 120-bushel corn crop. Of course, the second year's growth would prevent the growth of a grain crop that year. We can definitely maintain or increase organic matter with high-acre yields of corn if we use nitrogen to activate the chemical process."

Where flies are DDT-resistant, the most effective spray for killing flies on the wing uses pyrethrum as an active ingredient. Another method of control developed by recent research is poisonous baits. These combine poisonous compounds — malathion is one of the best — with sweetening agents that attract the flies and cause them to feed on the bait.

Bumper crops favor conservation in other ways. Once the rain gets into the soil, the extensive root system associated with a high-yielding crop retards run-off. The roots interwoven with the earth hold the soil in place.

At Newton, Illinois, soils made productive through the use of lime and fertilizer soaked up rain much faster than did low-yielding soils. In these studies, land that had been well treated for 30 years absorbed .26 inch of rainfall per hour, while adjoining land not limed or fertilized took up only .09 inches of rainfall in the same length of time.

The right kind and amount of fertilizer during this cost-price squeeze period is more important than ever before. Through mechanization and technical improvements, the fertilizer industry is giving the farmer more for his money than at any other time in its history. In spite of the drastic decline in farm prices, farmers can buy more plant food today with the proceeds from a bushel of corn than they could with a bushel of corn or a bushel of wheat 25 years ago.

For example, 25 years ago, it took 35 bushels of corn to buy a ton of 2-12-6 fertilizer. Today, the 2-12-6 fertilizer has just about disappeared from the farm landscape. It has been replaced by higher-analysis fertilizers. Today, however, the farmer can buy the same amount of plant food in a ton of 2-12-6 fertilizer with what he receives from the

sale of 29 bushels of corn.

Twenty-five years ago, it took 25 bushels of wheat to buy a ton of 2-12-6 fertilizer. Now, the same amount of plant food can be purchased with 18.9 bushels of wheat.

The grassland farmer finds himself in the same shoes as the grain farmer. Twenty-five years ago, it took 262 pounds of gain on a steer to buy a ton of 2-12-6. Today, 215 pounds of gain on a steer will buy the same amount of plant food contained in a ton of 2-12-6 fertilizer.

By using the right amount and the right kind of fertilizer, you can increase your profits. And the way to find out how much and what kind of fertilizer you should use is to have your soil tested.

Light Feeder Cattle Safest Bet

Light feeder cattle, weighing 600 to 700 pounds are — on the average, year after year — the safer bet for cattle feeders. So says Harry Smith, extension livestock marketing specialist at Colorado A & M.

Feeding heavy cattle often proves to be a trap — as is was last year. The reason, says Smith, is that the market for heavy, well-finished cattle of good quality fluctuates much more widely than does the market for light cattle. There were times late last summer when prime cattle over 1200 pounds were not worth any more on the Chicago market than choice cattle weighing 750 to 1000 lbs.

This year, in early April, prime steers weighing 1300 to 1500 pounds were quoted at $26 per hundred on the Chicago market. At the same time, the top on choice cattle was $23.50 for those weighing 900 to 1300 pounds. At times, the spread may be wider than that.

"It is at such times," says the marketing specialist, "that feeders may get the idea that the market really wants heavy cattle. It does. The trouble is that many feeders get the idea at the same time. They can easily overdo it. Six or 8 months from now, the 'heavy' market may be loaded. So, by the time a feeder can put some heavy feeders in the lot and get them finished, he may find he is going into a glutted market, so far as that kind of cattle is concerned.

"Any one who plans on feeding for the 'heavy' market must keep a pretty close check on the number and kinds of cattle on feed," Smith adds. —*Colorado A. & M.*

Change in Your Grazing Methods Can Boost Pasture Production

Modern ways to get more profits from pastures . . .

Condensed from Pennsylvania Farmer

J. B. Washko

CONSIDERABLE progress has been made in recent years in the development of better pasture management practices. In particular, grazing methods have received attention.

Continuous grazing has been discarded in favor of rotation grazing in most instances. Rotation grazing has been modified and has given rise to the strip grazing system in which cattle are shifted daily. The latest step in this progression to more intensive grazing management systems is "Zero grazing" or green forage feeding, in which the forage is harvested directly to the cows.

Just what advantages does each method offer? When considering what grazing system to adopt, the needs of both the livestock and pasture plants should be taken into account. For the livestock, pastures should be so managed as to produce the highest yields of the most efficient feeding nutrients each season, whereas the pasture should be grazed in such a manner as to prevent permanent plant injury and permit recovery periods for root reserve replenishment as well as top-growth.

Continuous Grazing

Continuous grazing is probably still the system most widely used today. Maybe this should be called lack of a system since it consists of turning out the cattle in the spring as soon as the grass becomes green and allowing cattle to run in the pasture until fall when unfavorable weather makes it necessary to barn the cattle.

When little grass is present, as in midsummer and late fall, supplemental feeding in the form of green-cut forage or harvested roughage such as silage or hay is practiced. Cattle may also be allowed access to the aftermath on hay fields or new seedings to minimize the amount of harvested forage required during this

Reprinted by permission from Pennsylvania Farmer, Pittsburgh, Pennsylvania

period of low production.

The only species that can persist under these conditions are Kentucky bluegrass, Canada bluegrass, redtop and white clover. The white clover comes and goes; some seasons it is very good, depending upon weather conditions; in others it is poor. The tall-growing, more productive species such as brome, alfalfa and Ladino cannot stand such abuse, hence disappear from pastures if subjected to continuous grazing.

Forage production is unevenly distributed throughout the season. There is more forage than livestock can use during the flush spring season of May and June; thereafter forage production drops off as the Kentucky bluegrass goes into summer dormancy. Grazing is generally spotted with some areas overgrazed, others undergrazed, so there is considerable waste of feed. Palatability varies with the season. It is good in the early spring but declines as the bluegrass approaches the seed-producing stage.

Rotational Grazing

Rotational grazing is a system whereby the pastures are divided into several paddocks and grazing animals are rotated from pasture to pasture, depending upon availability of forage. The size of paddocks is adjusted to herd size. Sufficient paddocks are established so that five or six animal units are carried per acre and at least one acre is allowed per animal unit per season. For example: a 25-cow herd would require 25 acres of pasture land for the season divided into five paddocks of five acres each.

What does rotational grazing accomplish? Plants are given recovery periods during the growing season for more or less unhampered development of top growth in order to maintain the roots in a healthy and vigorous condition. Thus greater amounts of nutrients in the form of herbage can be removed with less damage to the pasture sward. This system also enables the taller growing grasses and legumes to survive. Furthermore, it encourages equalization of grazing by preventing overgrazing and undergrazing and helps maintain a better balance between the legumes and grasses.

This method also provides more nutritious pasturage because the herbage is at the most ideal pasture stage when grazed. Rotational grazing discourages the grasses from heading out, particularly if the mower is used each time the cattle are shifted to new paddocks. The clipping also keeps the herbage growth uniform and more palatable. This system of grazing also helps control and prevent the build-

up of livestock parasites such as affect sheep.

Strip Grazing

Strip grazing or rotation grazing is the most intensive grazing system advocated at present. Under this system, which was developed under European and New Zealand conditions, from 40 to 80 animal units are stocked per acre and cattle are given access each day only to sufficient herbage to meet their needs by means of movable electric fencing. The advantages claimed for this method in other countries is that from 15 to 25 per cent more forage is removed per acre with a consequent increase in milk production. More uniform milk production also is obtained, since the same quality of nutritious forage is available each day. Under continuous and rotational grazing the first day the animals eat the most desirable plant parts which are the leaves and tips of plants, leaving the poorer and more mature herbage until forced to eat it later. Less herbage is soiled by dung, urine and tramping when strip grazing is practiced. The cattle settle down quickly, and instead of roaming about, immediately get down to steady grazing.

How successful has this system been when used in this country? In work completed at Minnesota it was found that only 1.8 acres of pasture land are required under strip grazing in comparison to 4.8 acres under continuous grazing to carry the same number of animal units. The other three acres not used for strip grazing were cut for hay twice during the season. For the season, 3138 pounds of total digestible nutrients were produced on daily strip grazing per acre as compared with only 1184 pounds per acre under continuous grazing.

There was little difference in total weekly animal production as measured by growth and milk production between these two grazing methods. The work does demonstrate, however, that while this intensive grazing system may not increase animal productivity it definitely does increase the number of animals which may be maintained on a given area of land.

Zero Grazing

Zero grazing or green feeding is designed to give more efficient and complete usage of grassland herbage than is obtained when cattle are allowed access to forage by the time honored practice of grazing. In this system the cow's "nip" is replaced by the forage harvester clip. Herds of from 20 to 30 cows can be fed from a self-feeder wagon so designed that forage heating is kept to a minimum and little

waste is possible. When large herds are to be fed, self-unloading wagons are usually used to fill feed bunks with green forage.

YOU CAN'T WIN

If a man runs after money, he's money-mad; if he keeps it, he's a capitalist; if he spends it, he's a playboy; if he doesn't get it, he's a ne'er-do-well; if he doesn't try to get it, he lacks ambition. If he gets it without working for it, he's a parasite; and if he accumulates it after a lifetime of hard work, people call him a fool who never got anything out of life.

Some idea of how much time and labor is required for green feeding operation can be obtained from results obtained at the New Jersey Dairy Research Farm where 50 Holstein cows were green-fed twice daily for three months. A direct-cut forage harvester was used in fields located from one to three miles from the dairy barn. It required three man-hours daily to harvest the 5,000 pounds of green forage required daily by the herd. Additional time is involved if a self-feeder wagon is used. Throwing the forage off the wagon into feed carts for barn feeding will add another one and a half hours per day to the feeding operation.

The advantages of this feeding system are: 1. It eliminates loss of forage by trampling, uneven grazing or contamination by manure. On orchard grass-Ladino pastures up to 25 per cent crop loss can be avoided. Where young oats or tall Sudan grass is first grazed, losses of up to two and one-half tons per acre of green material have been reported. 2. More efficient use of grassland acreage is obtained. Under green feeding 1.12 acres of grassland were required per cow as compared with 1.37 acres under rotation grazing at Rhode Island. Similarly, at Minnesota only .87 acre of grassland were required per cow for green chopping as compared with 1.45 acres per cow where grazed. In Iowa an acre of grassland under green feeding produced 520 pounds of beef per acre, and only 200 pounds per acre under grazing.

3. More nutrients can be produced per acre since forage is allowed to approach the hay stage before it is harvested.

4. Danger of bloat is minimized.

5. More uniform milk production is obtained by green feeding than under grazing because cows do not drop in production as they do when pastures become short.

As to the economics of green

feeding, it takes at least 25 cows to make the system pay according to Minnesota experiments. Because of the labor involved and the investment in machinery, costs of feed production under green chopping is greater than under grazing. It must be recognized, however, that these increased costs are offset to some extent by the saving in time spent taking cows to and from pasture, clipping pastures, in fence building and maintenance, and providing water in pastures.

The choice of a particular grazing system among those discussed will depend upon the kind of livestock enterprise practiced and individual farm conditions.

Continuous grazing is least satisfactory when considered both from animal and plant needs.

Rotational grazing has many desirable features and is a system that can be used for all classes of farm livestock — dairy cows, beef cattle, sheep, hogs or poultry. This system is simple, economic in use of labor and materials, and is a happy compromise in meeting both animal and plant needs.

Strip grazing has particular merit under conditions where the acreage of highly productive, accessible pasture land is limited. It is an intensive system that requires more labor, and closer attention to details than the rotation system. Strip grazing, however, is finding increasing favor on high-producing, intensively managed dairy farms as well as on irrigated pastureland.

Similarly, green chop or zero grazing is a feeding system which lends itself to complete mechanization, large-sized herds and limited productive cropland, but requires considerable investment in machinery, livestock and grassland crops. It also has particular merit where the location of grassland is such that it cannot be easily grazed because of distance, danger involved by cattle crossing busy highways or lack of water.

The United States meat industry is the world's biggest . . . its output is 25 billion pounds a year. People in this country use nearly all of this. Fully 80 per cent of this country's commercial production of meat is currently marketed with the Federal stamp of approval . . . the largest proportion in our history.

It becomes apparent therefore, that choice of grazing system depends upon many factors, and it remains for the individual farm operator to make the decision to adopt the system which best fits his farm enterprise and conditions.

These Farmers Have More Income

An interesting survey of a group of Michigan farmers who increased their incomes when most farm profits were dropping . . .

Condensed from Michigan Farmer
Ralph L. Hamilton

TWENTY-ONE farmers in Newton Township, Calhoun County, Michigan, have boosted their net income an average of $1,144 during the past 2 years.

Last year, their net income was $3,327; in 1953, it was $2,183. That's contrary to what most farmers have done, Michigan State University agricultural authorities believe.

For instance, a group of above average farmers in Eaton, Ionia, and Calhoun Counties lost about $2,300 net income a year in the 1953-55 period. This was shown in farm account records checked by Michigan State agricultural economists.

How have these Calhoun County farmers been able to go against the general trend of failing farm income? They have done a skillful job with their labor and capital and of adopting new research findings, points out Louie Webb, agricultural extension agent working with them.

Better organization of the farm business, better management, a closer watch on expenses, greater use of marketing information, increased efficiency of production and larger volume of business have helped boost incomes in the Newton township area, Webb believes.

These 21 farmers are part of a group belonging to the Newton Agricultural Extension Association, which cooperates with Michigan State University in extension work in that township.

This is an example of what Webb means by efficiency. The farmers have upped their gross income $2,236 a year in those 2 years. At the same time, their expenses increased only $1,092. Many brought their operations up to peak capacity. That meant higher net income, too.

Using more fertilizer and better crop varieties has resulted in more money after expenses, says Webb. New and improved cropping practices recommended by the Michigan Agricultural Experiment Station cut cash expenses.

Reprinted by permission from Michigan Farmer, Detroit, Michigan

As a result, one dairy farmer was able to raise milk production per cow from 7,300 pounds to 10,600 pounds in 2 years. Butterfat production went up from 289 pounds to 388 pounds. Culling poor-producing cows through DHIA testing helped boost milk production per cow, too. Through remodeling, this farmer was also able to increase the size of the dairy herd.

Mud thrown is ground lost.

Another Newton township farmer top-dressed oats with nitrogen fertilizer. Yields soared to 82 bushels per acre—highest in the farm's history. An investment of $5 per acre for fertilizer returned this farmer $25 per acre. This was in addition to possible holdover value of nitrogen for future crops.

Still another member of the Association was able to make adjustments in his farm organization that resulted in amazing savings in labor. A poultry and dairy farmer, he replaced an old inefficient poultry house with a new 1,200-hen capacity building to cut labor and feed costs and provide more comfortable housing for the layers. This change resulted in saving of one hour and 55 minutes daily in feeding and watering chores—700 hours a year. In addition, the number of birds being cared for was almost doubled.

Gathering, cleaning, grading and packing methods were changed, too, for a saving of about 1,000 hours annually. Web estimates the total savings at nearly $2,300 per year. Also, feed waste eliminated through automatic feeders amounts to about 6 tons per year.

Did you know . . . that a skein of cotton thread was among the treasured gifts that Columbus brought back to Isabella from the New World? And he took home the report that the Indians used cotton nets for beds and other domestic articles and that their women were dressed in cotton breeches!

Now in its third year, this township agricultural extension program is an experimental project conducted by the extension service. An agricultural agent works with farmers in one township or similar-sized area in improving their farm operations. It is supported in part by a grant from the W. K. Kellogg Foundation, Battle Creek.

Five such projects are under way in the state. The other 4 township programs can report boosts in income similar to that of Newton township. None report severe declines in income.

You Can Control Johnson Grass

This scourge of row crop fields is on its way out as a major pest—thanks to modern methods and chemicals . . .

Condensed from Farm Management

Ron Logan

"THE days of Johnsongrass ruling the row-crop fields of the nation is ended."

This is the startling promise of H. E. Rea of the department of agronomy at Texas A. and M. College. He has developed a combination of cultural practices and herbicidal treatment which makes Johnsongrass control not only possible, but also practical.

"Choose the practice or combination of practices which fits your field and your pocketbook," he says. Here are his recommendations:

SCATTERED CLUMPS — 5% infestation or less; use crown-oiling in cotton and corn. Use half naptha, half diesel oil, a squirt to each crown, before grass is six inches tall. Start early in spring, use four to six oilings 10 to 14 days apart. Costs $8 to $15 per acre, 98-plus % control.

LARGE SPOTS — 6 to 10% infestation, use Dalapon spotting in cotton and sorghums. For Dalapon spotting in cotton, use 15 pounds Dalapon, one and one-half pounds Fab (dish-washing detergent) in 75 gallons of water per acre. Spray tender foliage in spring and summer, leave undisturbed. Two treatments, 10 days apart in spring and summer cost $5 to $8 per acre, give 80-plus % control. For Dalapon-TCA in cotton and sorghums; use 15 pounds Dalapon, 30 pounds TCA, one and one-half pounds Fab in 75 gallons of water per acre. Spray foliage and soil once, seven to 10 days after crop emerges. Costs $5 to $8 per acre, gives 98-plus % control — and kills treated crop plants.

LARGE SPOTS — Each occupying more than two feet row space —11 to 50% infestation; use Dalapon-TCA spotting before cotton, or MH-30 spotting before any row crop. MH-30 spotting before any row crop; use five quarts MH-30 in 50 gallons water per acre or to thoroughly wet tender foliage. Spray 10 days before planting. Destroy tops of grass at planting or kill them with toxic oil. Costs $6 to $15 per acre, for 98-plus % control —at no risk to crops. Dalapon-

Reprinted by permission from Farm Management, Los Angeles, California

TCA spotting before cotton; use 15 pounds Dalapon, 30 pounds TCA, one and one-half pounds Fab in 35 gallons of water per acre. Spray foliage and soil 7 to 10 days before planting; do not disturb until planting. Costs $7 to $16 per acre for 80-plus % control, minor injury to cotton.

THICK STANDS — 51-100% infestation; use TCA to soil in fall, Dalapon broadcast before cotton, or MH-30 broadcast before any row crop. TCA to soil in fall; use 50 pounds TCA in 100 gallons of water per acre. Leave alone until after rain. Costs $3 to $27.50 per acre, gives 80-plus % control—no effect on cotton in spring, but do not use prior to other crops. Dalapon broadcast before cotton; use 15 pounds Dalapon, two pounds Fab in 50 gallons of water per acre. Spray tender foliage one to five days before planting. Do not disturb until planting. Costs $17.50 per acre for 60-plus control, no injury to cotton. MH-30 broadcast before any row crop; five quarts MH-30 in 50 gallons of water per acre. Spray tender foliage one to five days before planting, destroy tops of grass at planting or kill them with toxic oil. Costs $26.50 per acre for 60-plus % control, no risk to crops.

Crown-oil surviving grass following any of the above treatments.

CAUTION — In areas where crop is up before grass becomes active do not use broadcast treatments—spotting only. Use TCA in humid areas and when rain is expected soon after application. Absorption of Dalapon and MH-30 Johnsongrass foliage is slowed by low humidity. Both TCA and Dalapon have known soil effects. Expect stand losses when they are used in crops or shortly before planting. Allow four months for TCA to leave the soil; allow 30 days for Dalapon. Oils have no effect on the soil.

"For when the One Great Scorer comes to mark against your name, He writes not that you won or lost—but how you played the game."
—Grantland Rice

Naptha and Diesel oil fuel are available from bulk dealers. Use any which kills established Johnsongrass 24 hours after crown treatment.

Dalapon (Dowpon 85% made by Dow Chemical Co.) from Dow dealers.

TCA (sodium salt) from any Dow, Dupont or Orchard Brand dealer.

MH-30 (Maleic hydrazide) Naugatuck Chemicals Co. from Niagara Chemical Division and California Spray Chemical Co. dealers.

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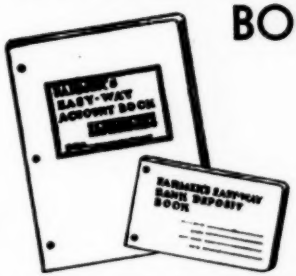

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Fort Atkinson, Wisconsin

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